PETROLEUM WEEK

NOVEMBER 16, 1956

■ A McGRAW-HILL PUBLICATION

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Price 35 Cents

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goes where you go . . .

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put FIRST financing
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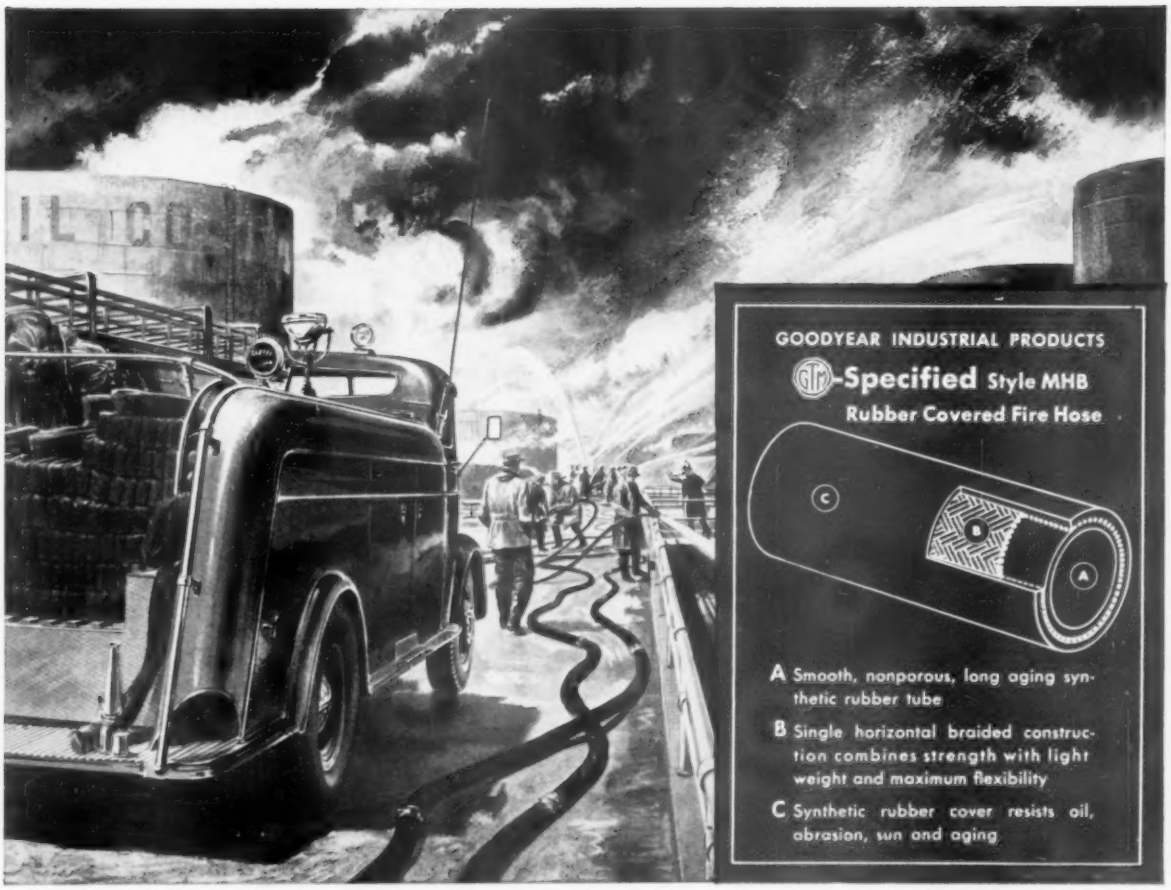

GOODYEAR INDUSTRIAL PRODUCTS
G.T.M.-Specified Style MHB
Rubber Covered Fire Hose
C
A
A Smooth, nonporous, long aging synthetic rubber tube
B Single horizontal braided construction combines strength with light weight and maximum flexibility
C Synthetic rubber cover resists oil, abrasion, sun and aging

G.T.M. offers the hottest thing in fire hose

THERE has long been need for a tougher, lighter weight fire hose with greater resistance to oil, abrasion and weather – especially around refineries and on oil transport vessels.

After thorough analysis of the problem, the G.T.M.–Goodyear Technical Man–and his colleagues, came up with the answer. It is a completely new hose – Style MHB Rubber Covered Fire Hose.

This new rubber hose is exceptionally flexible and light in weight. It is reinforced with a horizontal braid of high tensile synthetic fiber for extra strength. It is mildew inhibited throughout. And its specially developed rubber cover not only resists oil but snagging and hard wear as well.

If you want fire or wash hose that's built to withstand the toughest service, consult your Goodyear Distributor and/or the G.T.M. Or write, Goodyear, Industrial Products Division, Akron 16, Ohio.

RUBBER COVERED FIRE HOSE by

GOODYEAR

THE GREATEST NAME IN RUBBER

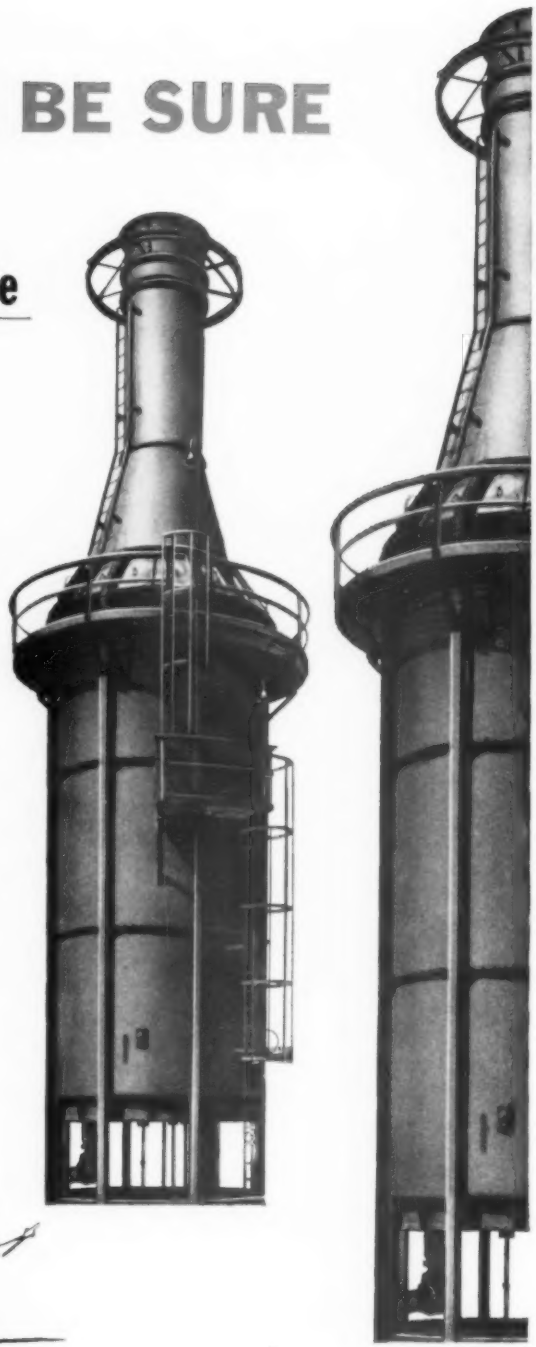
IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

YOU, too, CAN BE SURE

petrochem-isoflow furnaces

are most economically desirable

by any comparison

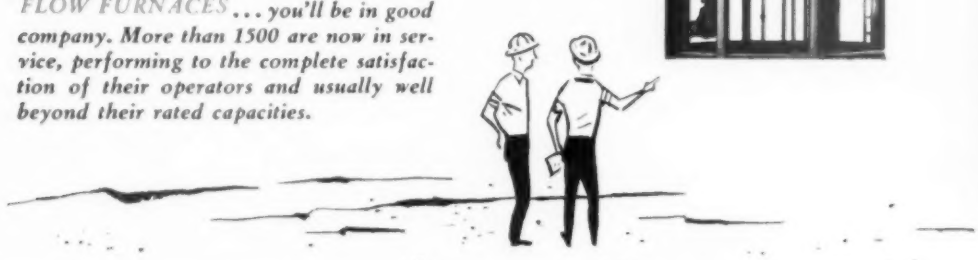


Whenever *all* the specifications and *all* the operating requirements are applied to direct-fired furnace design, you can be sure PETROCHEM-ISOFLOW FURNACES will be found most economically desirable, by any comparison.

In making comparisons it is essential to take these factors into consideration:

1—Average radiant transfer rate.
2—Maximum deviation from average radiant transfer rate.
3—Average and maximum transfer rate in convection section.
4—Maximum tube wall temperature, radiant or convection.
5—Maximum efficiency with specified excess air.
6—Controlled thermal recirculation of flue gases to provide even heat distribution throughout full length of each tube and equalized heat distribution around each tube.
7—Overload and corresponding transfer load.
8—Design to provide: structural column supports—Ladders—Platforms—Tube Removal facilities, etc.
9—Degree of assembly; of the furnace structure and of the heating surface.

When you specify PETROCHEM-ISOFLOW FURNACES . . . you'll be in good company. More than 1500 are now in service, performing to the complete satisfaction of their operators and usually well beyond their rated capacities.



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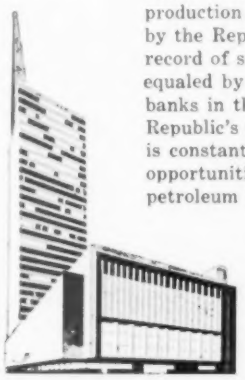
BEHIND MILLIONS OF BARRELS OF PRODUCTION

Financing by the Republic

The nation's oil reserves are millions of barrels richer because of production loans made by the Republic. With a record of service to oil men equaled by few other banks in the nation, Republic's Oil Department is constantly seeking opportunities to serve the petroleum industry.

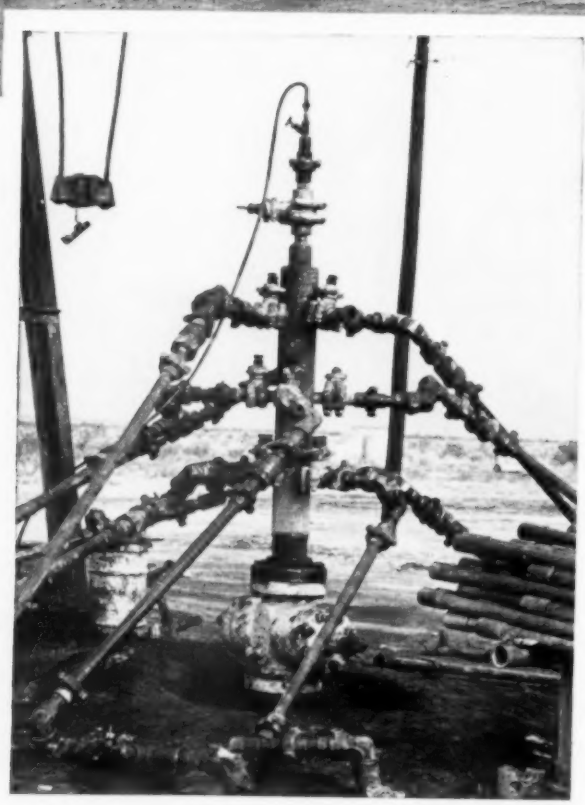


WHAT CAN *WE* DO FOR *YOU*?

REPUBLIC National BANK of Dallas

MEMBER FEDERAL DEPOSIT INSURANCE CORP.

CAPITAL AND SURPLUS $70,000,000
LARGEST IN THE SOUTH



Ten connections were made to a special header on this well in the Spraberry for the record fracture job. These lines fan out to eight pumping units which were positioned about 40 yards from the well.

Biggest Frac Job

The biggest formation fracturing job in the history of the oil industry was accomplished recently by Dowell Incorporated when 250,000 gallons of fresh water and 200,000 pounds of sand were pumped into an oil well in the Spraberry area of West Texas.

This treatment was made with the new Dowell service called Riverfrac* — using water as the frac fluid rather than lease crude or refined oil. No thickening agent was used.

As an indication of the magnitude of the job, 18 mobile Dowell units were used. The pumping trucks alone generated more than 7000 engine horsepower. Hydraulic horsepower totaled 4500.

Two blenders to mix the sand and water, eight sand trucks, eight truck-mounted pumping units and several pieces of auxiliary equipment were required. Four of the units were the new Allison pumpers which employ aircraft power to give high injection rates. Two units were diesel pumpers and two were "super Continentals".

The blended water and sand was pumped into the Spraberry formation at an average injection rate of 52

in History . . . *another* DOWELL *first*

barrels, or 2184 gallons a minute. Surface working pressure was 3400 pounds per square inch.

The well which received this record-breaking treatment was completed at 7767 feet for a good flow of oil in 1953. Its production declined characteristically, and it was pumping 27 barrels a day when taken off production for this treatment.

The previous record fracture treatment was established by Dowell in the McCamey Pool when close to 100,000 gallons of water was injected.

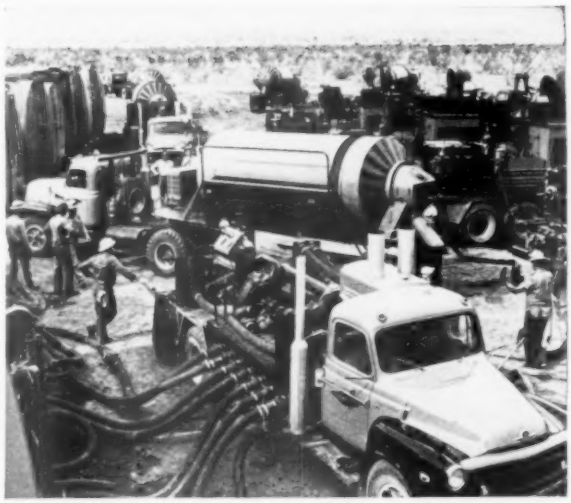
For service, or for more information, call any of the 165 Dowell offices in the United States and Canada; in Venezuela, contact United Oilwell Service. Or write Dowell Incorporated, Tulsa 1, Okla., Department K-75.

**Service Mark of Dowell Incorporated*

Services for the Oil Industry

DOWELL

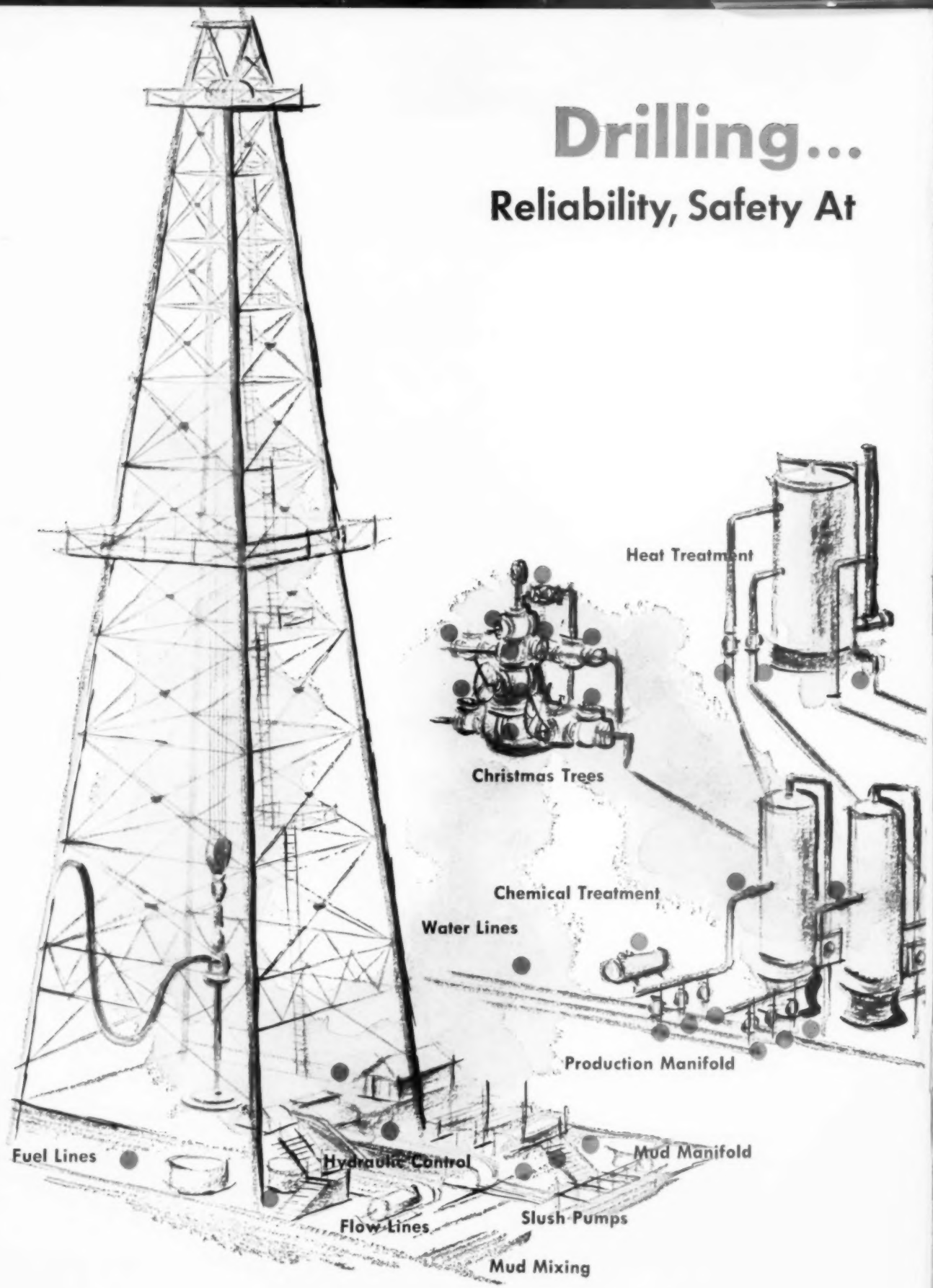
A SERVICE SUBSIDIARY OF THE DOW CHEMICAL COMPANY



Here is the "working area" for the record fracture job. In the foreground is one of two blender trucks which mixed the water and sand. In the center is a sand truck. Tanks which held the water are at left. Dowell's remote-controlled, Allison-powered pumpers are shown at right.

Drilling...

Reliability, Safety At



Completion...Production

Every Step With ROCKWELL-Nordstrom VALVES

Field men depend on Rockwell-Nordstrom valves for reliable, safe flow control. They know that Rockwell-Nordstrom exclusive Sealdport* lubrication assures leakproof, positive shut-off and instant, quarter-turn operation that can't be had in ordinary valves.

The dependability of Rockwell-Nordstrom valves has been proved by forty years of service throughout the oil and gas industries. They can't be matched from any standpoint, yet they cost no more to buy, often less than ordinary valves. For more information, call your supplier or write: Rockwell Manufacturing Company, Pittsburgh 8, Pa.

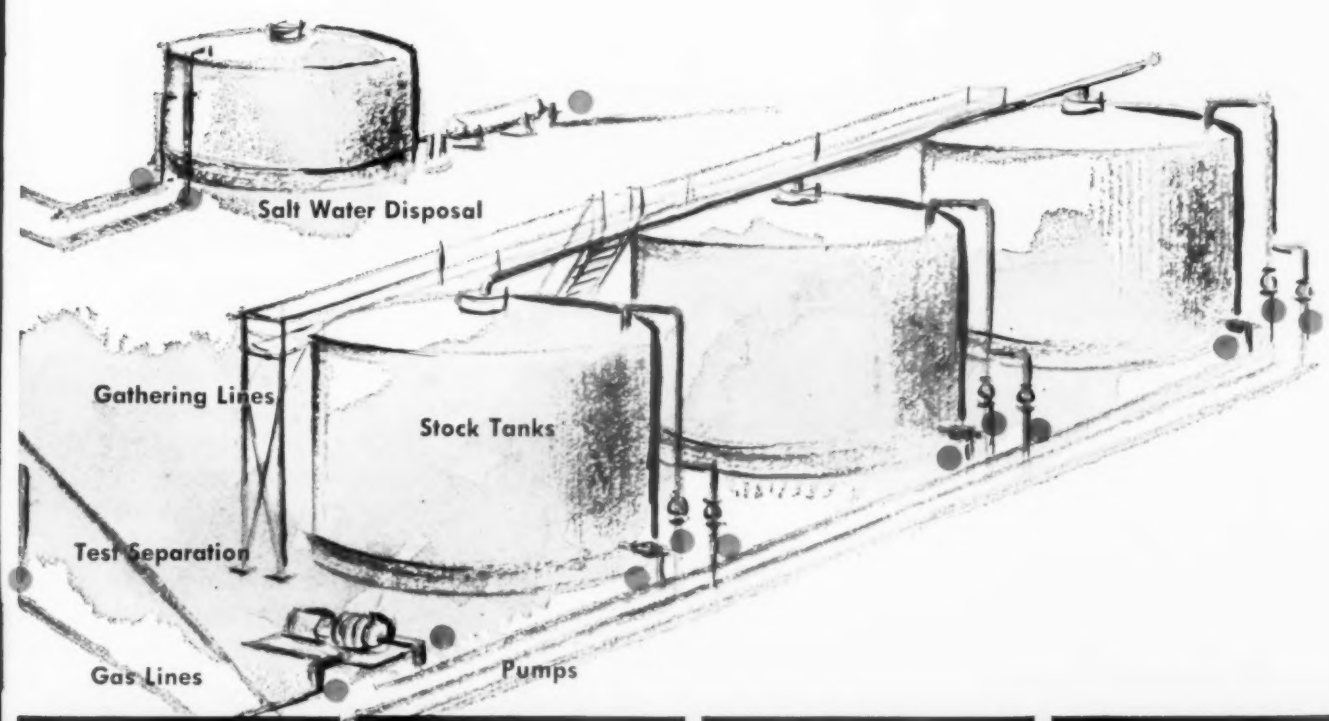
Canadian Valve Licensee: Peacock Brothers Limited.

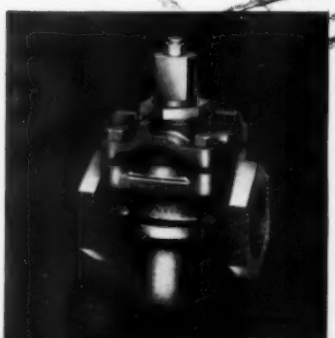
*Registered trademark Rockwell Manufacturing Company

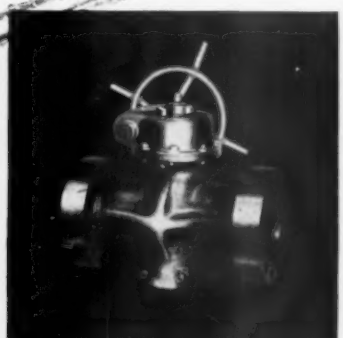
ROCKWELL-Nordstrom VALVES

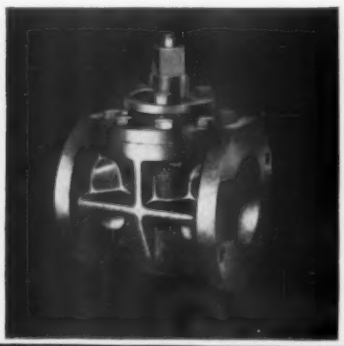
Lubricant Sealed for Positive Shut-Off

40th YEAR *of lubricated plug valve leadership*



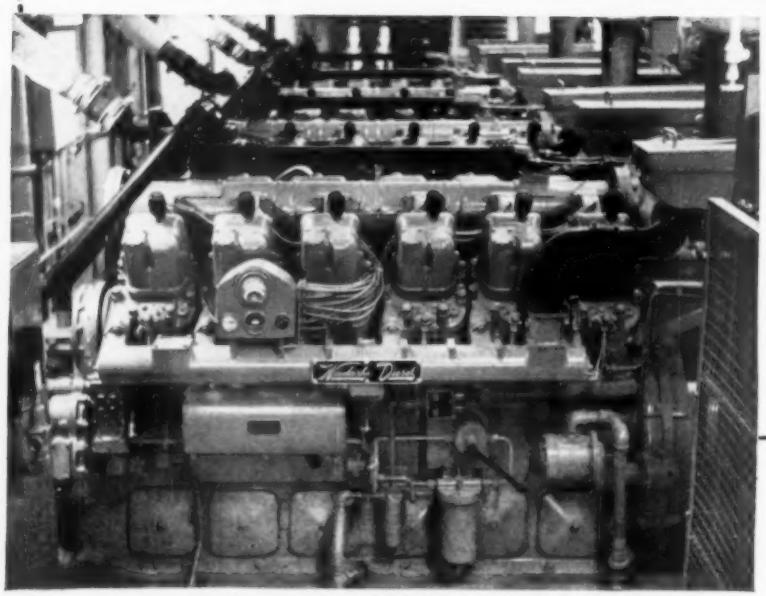






4 Big WAUKESHA V-12 *Turbodiesels*

Power this NEW OFFSHORE DRILL RIG

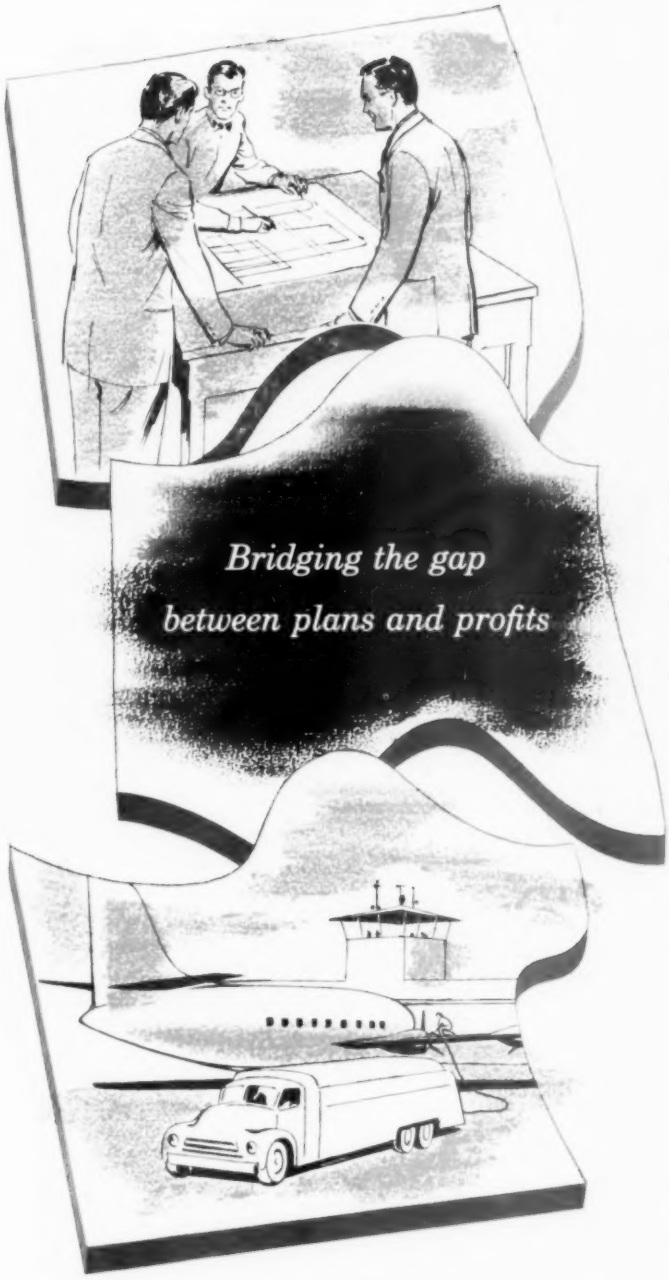


The 4 big Waukesha VLRDBSU 5788 cu. in. Turbodiesels

● This elevated deck offshore barge was built for the California Co. by Avondale Shipyard; drilling equipment and operation by the Noble Drilling Corporation. Oil men who have seen this remarkable equipment were much impressed by the array of big Waukesha Turbodiesels which are the prime source of power.

WAUKESHA MOTOR COMPANY
WAUKESHA, WISCONSIN
New York • Tulsa • Los Angeles

319



WORLD'S LARGEST SOVAFORMER...

engineered and constructed by FLUOR

Socony-Mobil Oil Company, Inc. now owns the largest commercial Sovaformer ever built. This giant unit, rated at 20,000 barrels-per-stream-day, produces high octane motor fuel and aviation gasoline to meet the increasing demands of today's high compression engines.

The project—with a construction period of only 12 months—is another example of how The Fluor Corporation, Ltd. swiftly turns management planning into profitable production. Whether your plans call for a complete processing plant or a single unit, it will pay you to get acquainted with Fluor.

The Sovaformer covers an area of 120,000 square feet. Consisting of a catalytic reformer section and a naphtha pretreater section, the Sovaformer was Fluor's second multi-million dollar project completed at Socony Mobil's Paulsboro, New Jersey refinery in the past three years.

FLUOR *ENGINEERS and CONSTRUCTORS*
for the Petroleum, Chemical and Power Industries

The FLUOR CORPORATION, Ltd., Los Angeles – Mid-Continent Division, Houston – Fluor of Canada, Ltd., Toronto – H. G. Acres & Company, Niagara Falls, Ontario – Singmaster & Breyer, Inc., New York City

Frank Watts, left, veteran store manager for an independent distributor, having a branch at Bay City, Tex., and H. P. (Pat) McGuirt, tool pusher for Otis Russell Drilling Co., watch Pittsburgh Seamless casing being unloaded at a rig near Damon, Tex.

Santa Claus Must Wait When Oil Field Emergency Arises

It's shortly after midnight as Frank loads a swedge from his store for delivery to the Damon well.

Once he's at the well, Frank sits down in the bunk house with Mr. McGuirt to go over an order for delivery the next day.

Here's Why You Can Rely On Pittsburgh Steel's Independent Distributors

'Twas the Night Before Christmas in Bay City, Texas, as Frank Watts, his wife and their children retired for the night.

A few hours later—4 a.m., to be exact—Frank was awakened—not by Santa Claus and his reindeer, but by a telephone call from a driller 35 miles away.

Due to an unavoidable incident a small valve was needed immediately.

Because Frank Watts is a veteran supply man and manager of an independent supply company store (representing Pittsburgh Steel Company) in Bay City, he knew the importance of the driller's call. Holding up drilling costs money, whether it's Christmas morning or the 23rd of July.

Frank was on his way quickly, opened the store, got the valve, delivered it and made it back home in time to watch the kids open their gifts at 8 a.m.

This was not an unusual event as his wife recalls any number of times when Frank has shown up at dawn due to similar emergencies. For example, there was the night when he made a round trip to Houston (180 miles) for $12.00 worth of parts he was temporarily out of and which were badly needed on a rig.

At 36, Frank Watts is a tall, raw-boned, friendly man the movies would cast as a typical Texan. But more important, he's an oil field business man, a representative of one of the 18 independent distributors (listed at right) handling Pittsburgh Seamless. And he has nearly 15 years of experience under his belt.

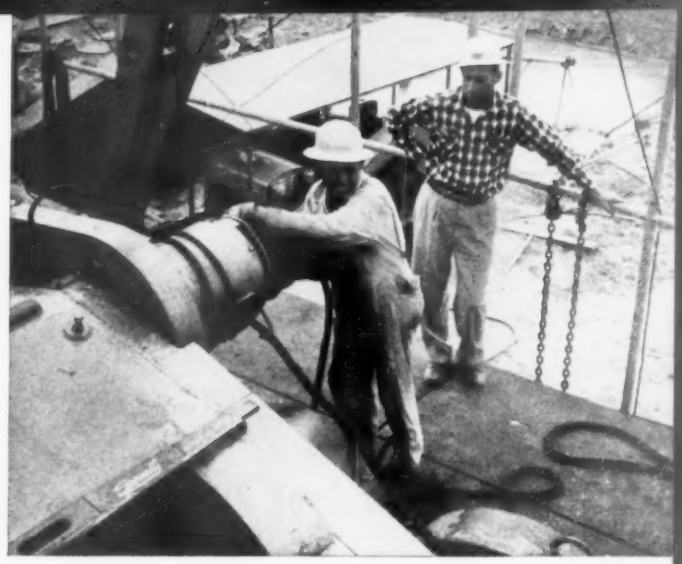
He is accustomed to working 65 hours a week and it doesn't bother him to get frequent night calls, half of them to open his store so a driller can get an item he needs, the other times an SOS for delivery of supplies to keep a drilling operation going.

Frank Watts has "service" as his first and strongest business byword. Quality of the products he handles is a close second. As he puts it:

"I learned a long time ago that service and the best products available are the keys to profit and success in this supply business.

"If we handle only good quality stuff, proven material the men at

An oilman's assurance of quality—Pittsburgh Seamless—is the topic of this conversation Frank is holding at the well-site.



Frank watches cat-heading of Pittsburgh casing as it is run into hole. Frank's company handles a full range of Pittsburgh Drill Pipe, casing and tubing.

the rigs can rely on, and give them all the service they need, we'll get their business and we'll keep it."

Those words stand as testimony to the quality of Pittsburgh Steel Company's drill pipe, casing and tubing. The company Frank works for handles only Pittsburgh drill pipe, although it offers several manufacturers' casing and tubing.

They prove, too, why the independent supply house has become such a vital force in the oil and gas fields.

Independent distributors are ready for action around the clock. Frank's store stocks nearly 3,000 different items ready for delay-free normal operation or for emergencies.

An independent distributor's service is flexible. The independents are personal friends to the oil men they serve. Through their long experience, they know the problems oil men face and can meet their requirements without red tape and extra paper work. They are free from remote control and can make big decisions without wasting time. The independent store is usually the first in an oil field and the last to leave, if it ever does. Its personnel live in the area their stores serve. Their own personal futures are tied to the success they generate for themselves.

Independent distributors help keep costs low. Though they specialize in service, their prices are competitive. Their livelihood depends on meeting competition. Almost with no exception, the independent's representative will stay in the area of his store, not move on every couple of years. The money the independent makes stays where he makes it.

The independent offers only the best in equipment because he buys only what he wants to buy. He is free to select from the best equipment made. Pittsburgh Steel and all the other reputable manufacturers back up the independent distributor.

Independents are the most accessible suppliers in the oil fields. For example, Pittsburgh Steel's distributors have a total of 140 stores in all parts of the oil and gas fields.

Next time you buy drill pipe, casing or tubing use the team that can't be beat: Pittsburgh Seamless and your independent distributor.

Distributor Home Offices

Bradford Supply Company
130 Main Street
Bradford, Pennsylvania

Buckeye Supply Company
18 Harrison Street
Zanesville, Ohio

C. W. Cotton Supply Company
Utica National Bank Building
Tulsa 5, Oklahoma

Franklin Supply Company
624 South Michigan Avenue
Chicago 5, Illinois

Houston Oil Field Material Co.
1524 Maury Street
Houston, Texas

Industrial Supply Company
500 Eighth Street
Wichita Falls, Texas

Iverson Supply Company
400 West Fifth Street
Tulsa, Oklahoma

Lucey Export Corporation
233 Broadway
New York 7, New York

Lucey Products Corporation
624 South Cheyenne
Tulsa 19, Oklahoma

McJunkin Corporation
P. O. Box 513
Charleston 22, West Virginia

Midland Supply Company
Box 3105
Washington St. Station
Wichita 7, Kansas

Mountain Iron & Supply Co.
100 Rule Building
Wichita 2, Kansas

Murray Brooks, Incorporated
P. O. Box 855
Lake Charles, Louisiana

Producers Supply & Tool Co.
706 Commercial Standard Bldg.
Fort Worth 2, Texas

Rodman Supply Company
P. O. Box 2752
Odessa, Texas

Southwest Supply Company
1720 Oliver Building
Pittsburgh, Pennsylvania

Superior Iron Works & Supply Co.
P. O. Box 1800
Shreveport, Louisiana

Western Supply Company
424 North Boulder Avenue
Tulsa 1, Oklahoma

Pittsburgh Steel Company

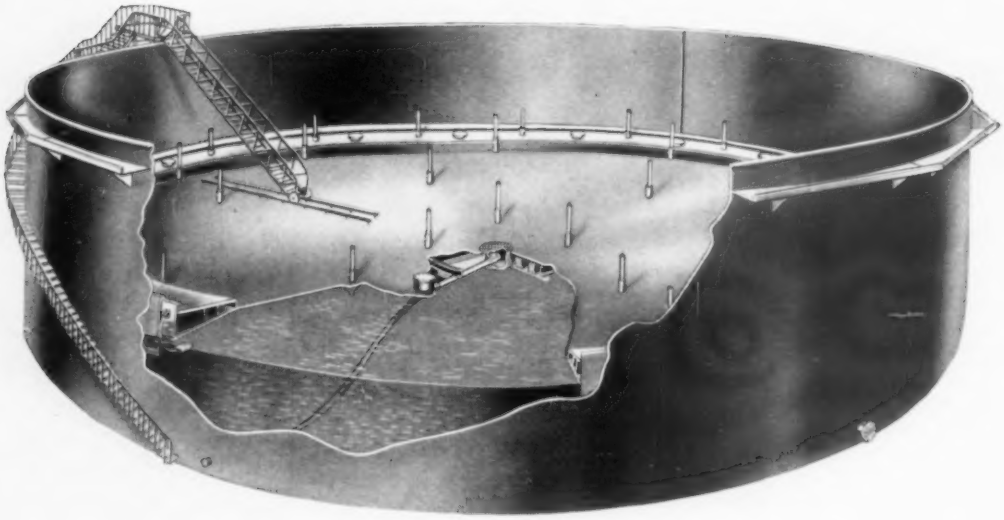
Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta	Columbus	Detroit	New York	Tulsa
Chicago	Dallas	Houston	Philadelphia	Warren, Ohio
Cleveland	Dayton	Los Angeles	Pittsburgh	

GRAVER

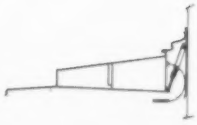
WE'VE CLEARED THE DECK...



STABLE . . . because, ship-like, the center of buoyancy is below the center of gravity.

CORROSION-RESISTANT . . . because the liquid in storage is in full contact with the deck.

SELF-DRAINING . . . rainfall flows to the Graver sump at the center low point of the roof.



VAPOR-STOP SEAL . . . Graver's patented single seal . . . proved effective against vapor loss.

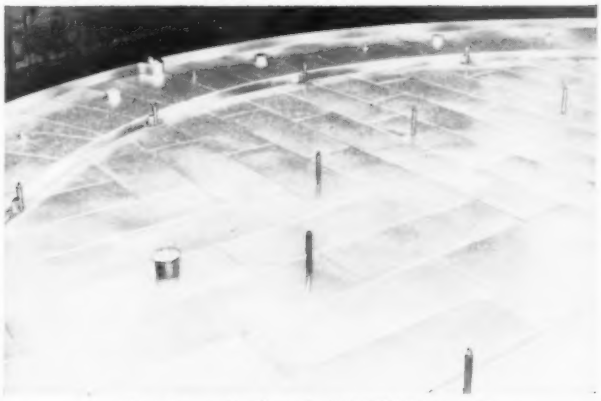
. . . FOR A NEW, LOW-COST FLOATING ROOF TANK WITH UNDER-DECK CENTER WEIGHT

Here is another outstanding Graver first in single-deck floating roof tanks. We've cleared the deck for easy snow removal and positive drainage by putting the center weight *below* the deck. This effects additional economies in construction without sacrificing the long-established advantages of Graver's patented single-deck floating roof principle and characteristic Graver quality. This new Graver floating roof tank (both pontoon and pan type) has been thoroughly proved by installations across the nation. May we give you complete details?

GRAVER®

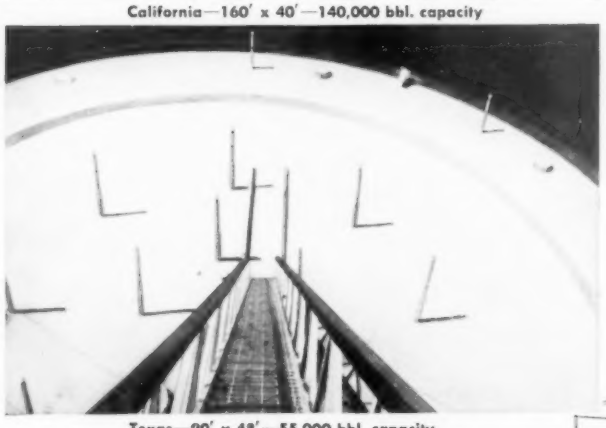
GRAVER TANK & MFG. CO., INC.

EAST CHICAGO, INDIANA • NEW YORK • PHILADELPHIA • EDGE MOOR, DELAWARE
PITTSBURGH • DETROIT • CHICAGO • TULSA • SANDS SPRINGS, OKLAHOMA
HOUSTON • LOS ANGELES • FONTANA, CALIFORNIA • SAN FRANCISCO



New Jersey—140′ x 40′—110,000 bbl. capacity

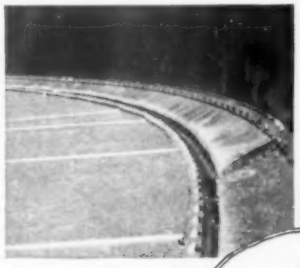
California—160′ x 40′—140,000 bbl. capacity



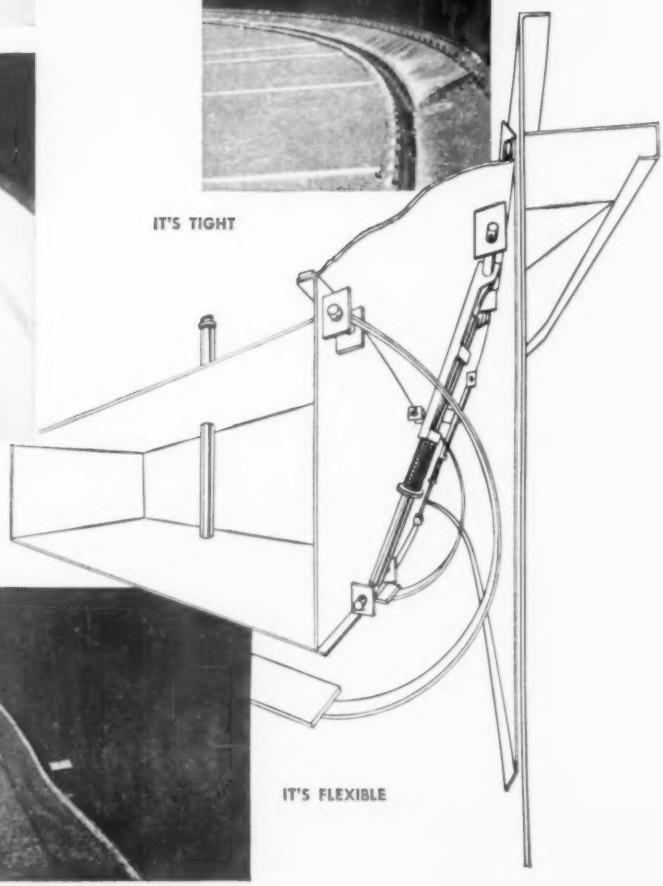
Texas—90′ x 48′—55,000 bbl. capacity

PROVED WHERE ECONOMY COUNTS...

The demands for more production and greater storage capacity with the least investment has attracted a number of well-known companies to the new low-cost Graver under-deck center-weighted floating roof tank. The typical installations at the left show the obvious advantages of Graver's new clear-deck single roof in all climates.



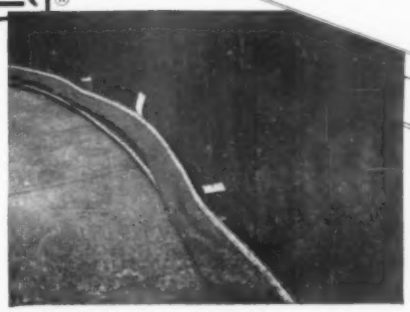
IT'S TIGHT



GRAVER®

SINGLE VAPOR-STOP SEAL

Graver's patented Vapor-Stop single seal is an inherent feature. This effective seal rides "tight" over weld seams on new construction and rivets on re-roofed tanks.



IT'S FLEXIBLE

Six Rigs—Four Companies

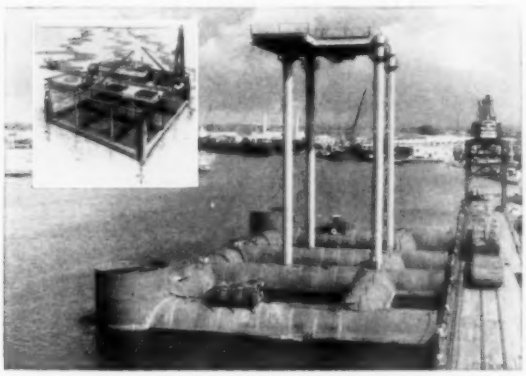
ALL ELECTRO-

—All Diesel-Electric...and

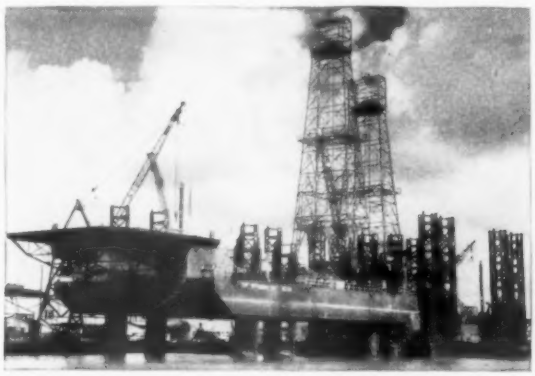
-MOTIVE POWERED

We had this aerial view of the yards at Orange, Texas, taken for just one reason. It tells more literally than words how Electro-Motive Power is being accepted in the drilling industry everywhere. In this one photograph, there are six offshore drilling platforms or tenders in various stages of construction for four different concerns. All have one major thing in common: *each is equipped with Electro-Motive Diesel-Electric Power.*

For drilling over land or water it will pay you to investigate the flexibility, control and economy of Electro-Motive Power—the new standard for deep drilling applications. Contact your Electro-Motive representative for complete details.

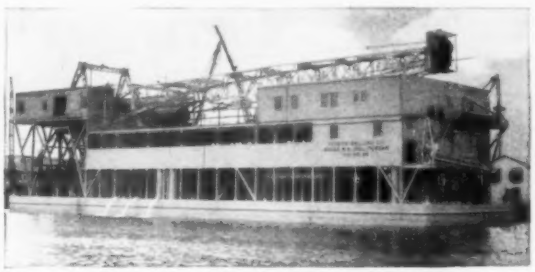


1 Shown here is Kerr-McGee's Rig No. 47, a mobile type of drilling device under construction by American Bridge Division of U. S. Steel. Three Electro-Motive Power units will be located on the rig, supplying power for mud pumps, drawworks and rotary table. Due for completion late this year, the drilling device brings to three the number of Electro-Motive Powered rigs for Kerr-McGee.



2 Rigs No. 54 and 55 for Offshore Company are shown here nearing completion in the American Bridge yards of U. S. Steel Corp. These mobile drilling barges, each powered by three 875 hp. Electro-Motive Power units, are capable of operating in waters up to 100 feet in depth. Each barge measures 200 feet long and 104 feet wide and contains eight hydraulically operated, 225-foot supporting legs.

3 This tender, one of four being converted for a major oil company, is shown at the Levingston yards at Orange. A former LST, the tender features a heliport and is completely outfitted with modern eating, sleeping and recreation facilities for the crew. Two 12-cylinder Electro-Motive Power units rated at 1200 hp. each will be located in the tenders as the power source for large mud pumps.



4 The Penrod Drilling Company's W. H. (Bill) Dordan, a submersible island drilling barge, powered by 3 Electro-Motive units, is one of two recently christened. Built by Levingston, the Dordan is now drilling for Placid Oil Company. The second Electro-Motive powered barge, the Tom Sorrell, is also completed and drilling for Placid Oil. Both these barges are capable of drilling 18,000 feet in 19 feet of water.

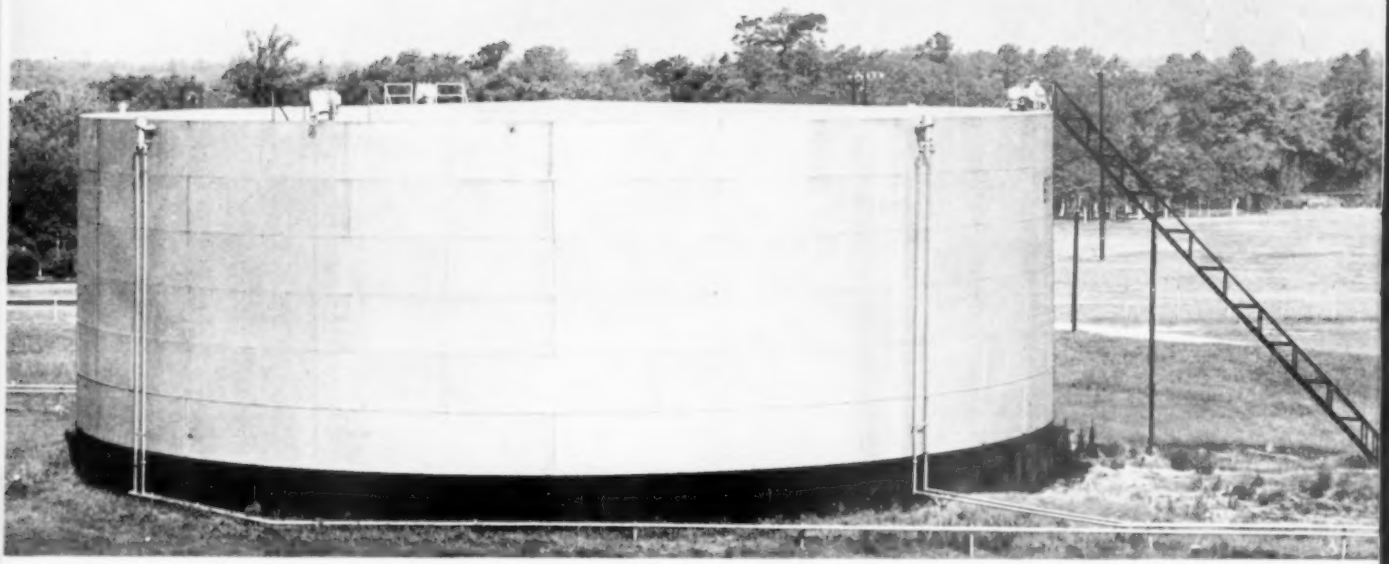
ELECTRO-MOTIVE DIVISION · GENERAL MOTORS

LA GRANGE, ILLINOIS *In Canada:* General Motors Diesel Limited, London, Ontario

Petroleum Industry sales offices: Tulsa, Oklahoma; Houston, Texas; Dallas, Texas; Morgan City, Louisiana; Pasadena, California

Sinclair tank reduces evaporation every working hour

with Microballoon spheres*



Test tank has a discharge rate of 2000 bbl. per hour, with five turnovers per month. Average temperature is 75 deg. F., RVP is 5.6 psi. Since its evaporation loss was about half that of the control tank, additional tanks at this **Sinclair Refining Co.** location are due for this system of evaporation control.

For more than two years, Sinclair Refining Co. has had one of its older 80,000-bbl. cone-roof tanks at Houston, Texas, equipped with a vapor-stopping seal of Microballoon* spheres made from BAKELITE Brand Phenolic Resins.

Results of this test now show that evaporation loss was approximately half that of the control tank, which had no seal.

The effective use of the foam seal treatment can help you reduce needless waste due to evaporation.

To learn more about this method of control, write Bakelite Company, or *Chicago Bridge & Iron Company, Chicago 4, Ill.*

*Registered trade-mark of The Standard Oil Co. (Ohio)

for evaporation control . . .

BAKELITE BRAND RESINS

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N.Y.

In Canada: Bakelite Company, Division of Union Carbide Canada Limited, Belleville, Ontario

The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC

60-Second Summary / WHAT'S HAPPENING IN OIL

AT-A-GLANCE Copyright PETROLEUM WEEK

November 16, 1956

dept/INDEX

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Almost overnight, the Middle East crisis has changed the immediate oil picture. Old problems, such as imports, have eased—at least for now. But there are new concerns, such as how to meet greater costs arising from the extra effort which is being called for to keep oil moving to where it's needed. . . . p. 23

Several top-flight industry officials are being called for emergency duty in Washington. There will be no reactivation of PAD—at least not now—but there will be considerable expansion of the scope of the Interior Dept.'s Office of Oil & Gas. In addition to calling key men for temporary duty, OOG is also beefing up its permanent staff.

Saudi Arabia's action in cutting off oil to England and France has made their already-desperate supply situation worse. It means these two nations must look elsewhere for crude. This increases the burden on overloaded transportation facilities. . . . p. 59

The British, seeking a long-range solution, may back some new drastic moves. There are reports that England would like to see Iraq annex Jordan, and Iraq and Turkey to split Syria. The aim: to put the pipeline routes in the hands of a nation less susceptible to Communist domination. Obviously, such a move would stir violent opposition. . . . p. 27

•

Automation is neither a bugaboo nor a cure-all. But the increased pace of technological advance does mean growing changes in oil company operations and management. A Petroleum Week Special Report shows the impact on each industry segment—and on the individuals within the industry. . . . p. 71

•

A new strike in the Santa Cruz Basin heightens interest in the current boom shaping up in that West Coast area. The discovery, by Neaves Petroleum Developments, Inc., is the first major hit in the wildcat rush following Union Oil's initial find a year ago. . . . p. 36

•

Drilling will start soon on new oil concessions in Venezuela's Lake Maracaibo region. Most of the companies plan to get drilling under way by early next year. Meanwhile, those who lost out in the first round of new grants are watching for new chances to bid on the next offers. . . . p. 54

•

Natural gasoline producers are slowly adding refining facilities to upgrade low-octane, low-value product. But the payout is a question. . . . p. 106

•

Oil earnings are again headed for a record year. Even so, the rate of gain isn't quite as great as it was in the first six months of this year. . . . p. 28

Looking Ahead in Washington

McGraw-Hill
Washington
Bureau

November 16, 1956

Look for both political parties to move left on pocketbook issues. Oil may be in for more trouble than appeared likely when the election results were first counted. Although Eisenhower won in a walk, the voters gave congressional Democrats a new vote of confidence. GOP strategists are saying that—if they hope to keep the White House in 1960—they must destroy the "myth" that the Democrats are the party of the people.

The GOP will try to out-do the Democrats in championing the "little man." Republican strategists want to be out in front on measures to help the laborer, the small businessman, and the consumer. And they'll try to avoid getting tarred—rightly or wrongly—with the "special interest" brush. This, in turn, will spur further antibusiness action by some Democrats.

•

Anti-price-discrimination legislation will be introduced quickly. The Patman-Kefauver bill, which would have made it hazardous for gasoline suppliers to reduce prices to meet competition, failed in the last Congress only because it got a late start. This time the House Judiciary Committee won't have to be pushed into clearing this legislation—which has tremendous small-business backing. The attitude of the Administration may determine its fate.

•

Oil marketing will be investigated again. The National Congress of Petroleum Retailers will push for legislation divorcing major oil companies from operation of company stations in competition with lessee dealers. The National Oil Jobbers Council may ask the government for help with its problems (page 26). Except for a possible new Patman-Kefauver bill, no new legislation is likely to result. But Congress may now be in a mood to vote money for an ambitious oil study by the Federal Trade Commission.

•

You'll get an early tipoff on the fate of new gas legislation. Senate Majority Leader Lyndon Johnson (D., Tex.) repeated last week that any new bill easing federal control over gas producers must be initiated by President Eisenhower. This confirms the report that Democratic leaders will sit on their hands unless the President recommends legislation in his state of the union, economic, or budget messages. If the House Commerce Committee doesn't schedule the gas bill early in 1957, you can assume that the Democratic leadership on Capitol Hill has decided to let it die.

Industry unity is seen as a must—but not as a cure-all. Any bill lacking the blessing of distributors probably won't satisfy Eisenhower's insistence that it protect consumers. But industry unity won't muzzle such critics as Sen. Douglas and Sen. Morse, or anti-industry newspaper columnists. The White House will weigh carefully the political hazards for the GOP before getting behind any new gas bill.

There's a positive side to the coin, however. The Middle East crisis—and the resulting demand for U.S. oil—may remove oil imports as a congressional issue in 1957. In the political scheme of things, this will tend to make things easier for a new gas bill. And the crisis underlines the essentiality of U.S. oil resources—which will reduce pressure for lower percentage depletion and tougher treatment on public lands leasing.

THEY FLY AT FULL POWER WHEN GASOLINE CONTAINS

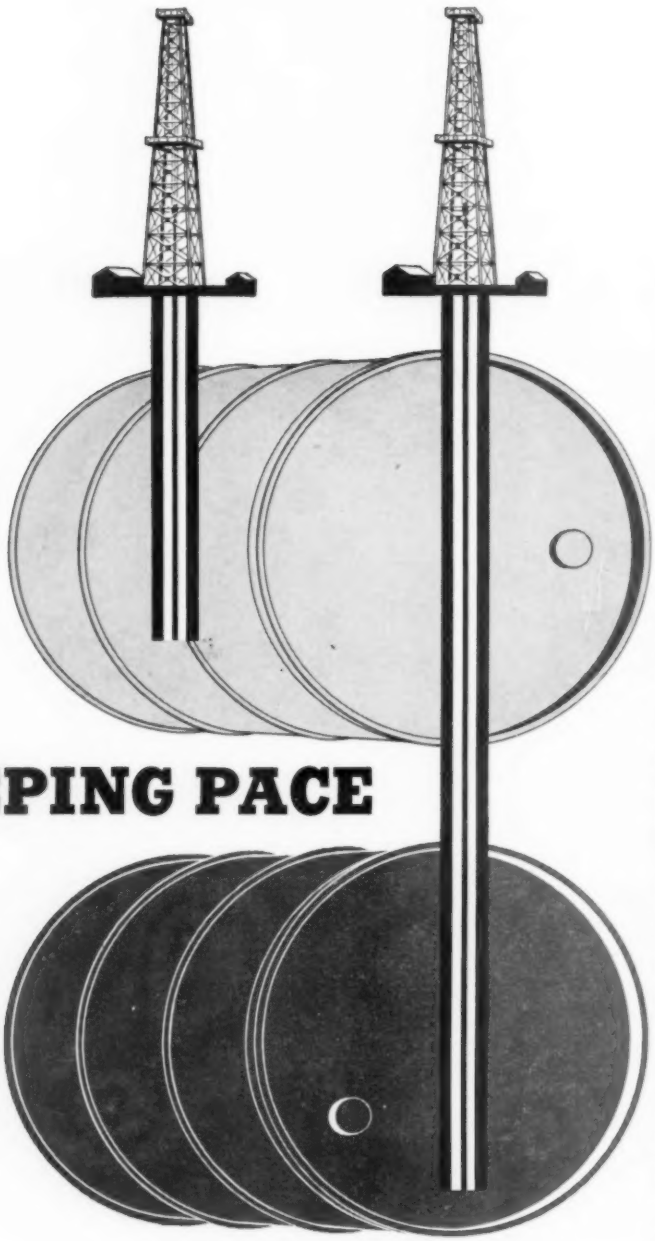
Tenamene

EASTMAN GASOLINE ADDITIVES

Protect the performance of the gasolines you produce. Tenamene inhibits gum formation, assuring engines of the full power you build into your fuels. An Eastman petroleum specialist is always available to assist you in achieving maximum performance from these dependable additives.

For more information on Tenamene additives and the service that backs up their proper use, contact our local representative or write to EASTMAN CHEMICAL PRODUCTS, INC., *subsidiary of Eastman Kodak Company,* KINGSPORT, TENNESSEE.

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; New York City; Framingham, Mass.; Cincinnati; Cleveland; Chicago; St. Louis; Houston. **West Coast: Wilson Meyer Co.,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.



KEEPING PACE

Drills were chewing their way down for about 2000 feet in the search for oil in 1916. Today's drilling depth is more than double that.

The change in drilling that forty years has brought well symbolizes many advances in the petroleum and chemical industries. Engineers have dug more deeply into the secrets of nature, too . . . have designed plants and processes to wrest new products and services from petroleum, ores and elements.

We mentioned 1916 because that is the year Sun Ship was founded. It has long served the swift-growing needs of petroleum and chemical industries. Year by year, the engineering skill and facilities of the great Sun Ship plant have proven their ability to meet the demands for plant and equipment keyed to the swift pace of progress in these and other important fields. Sun Ship keeps pace with progress.

Sun

SHIPBUILDING & DRY DOCK COMPANY

SINCE 1916

ON THE DELAWARE • CHESTER, PA.

J&L adds a Gulf Coast Store at

MORGAN CITY, LA.

B. E. TRISLER, Morgan City Store Manager, formerly Manager of the J&L store in Lake Charles, La.

In the Gulf Coast area of Louisiana, where the Acadian tongue is as common as English and the shrimp boats ply their ancient trade in sight of man's most modern achievements in drilling for oil, J&L Supply has opened a sixth store, this time at Morgan City.

As in the case of all other J&L stores in the United States and Canada, the Morgan City plant is manned and stocked to meet requirements peculiar to its locale.

The new store brings J&L service facilities (stores, sales offices, and district offices) to a total of one hundred and twenty-six.

Above, left to right: LORAN W. TODD, Sales Representative, formerly with the J&L store in Houma, Louisiana. G. E. BENDER, W. L. HERRINGTON, P. T. HUDDLESTON, and G. R. ROBINSON, Storemen.

New J&L store at Morgan City, on Highway 90, about one mile east of the City limits. (Wyandotte Subdivision.)

CLARENCE E. ROGERS, District Sales Manager, Loiusiana Gulf Coast District, headquartered at New Orleans.

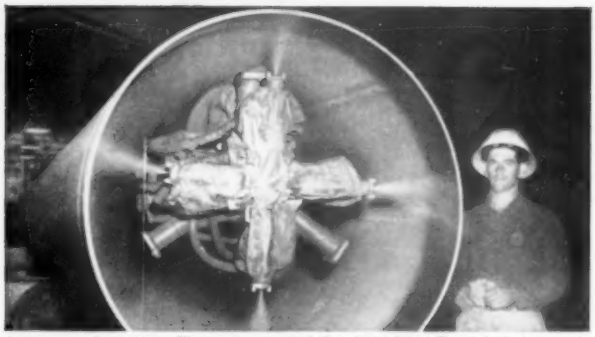
Jones & Laughlin

SUPPLY DIVISION – Tulsa

SERVING THE UNITED STATES AND CANADA

EPON® RESIN does it!

New Internal Coating *protects pipelines against corrosion by crude oil, salt water, gas*



36" pipe to be laid by Transcontinental Gas Pipe Line Corp. being coated with *Copon*, containing Epon resin. *Copon* is manufactured by Coast Paint and Lacquer Co., Houston.

Stock of 36" pipe, lined with Epon resin coating, to be used by Transco.

HERE'S HOW...

INTERNAL CORROSION of gas pipe lines has long been a costly maintenance problem. The solution is an Epon resin coating that stands up to corrosives, that does not flake or peel off, that can be readily applied.

Such an Epon resin-based enamel is now going to work in nearly 300 miles of line for Transcontinental Gas Pipe Line Corp.

It's a *one-coat*, amine-catalyzed system which, cured at atmospheric temperatures, gives the performance of many baked finishes never before obtained with any other cold-cure coating. The Epon resin liner has complete adhesion to metals and extreme resistance to corrosion that keeps gas free of rust and pipe scale.

If you need a paint that lasts longer, that has excellent adhesion, resistance to abrasion and impact, ability to withstand a wide range of temperatures, humidity and corrosive atmospheres . . . ask for *Epon resin coatings*. Call on our sales offices for names of suppliers. Write for the full Epon coatings story in the brochure, "Planning to Paint a Pyramid?"

Epon resins are the epoxy polymers made exclusively by Shell Chemical Corporation.

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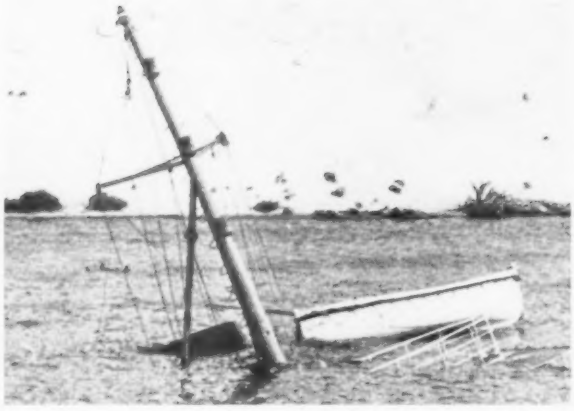


BOTTLENECKS in transportation, such as in Suez Canal (above), are causing crude-moving charges to spiral upward. But . . .

Will Crude Prices Rise With Costs?

The costs of supplying U.S. crude to oil-short domestic and foreign markets are mounting rapidly. But strangely enough, the chances of making offsetting price increases are all but bright just now.

This paradoxical situation is the chief conversation piece this week among oil men attending the API annual meeting in Chicago—and of oil men around the world. And there seems to be no simple solution to the world industry's dilemma.

Briefly stated, the dilemma is this:

- Refiners around the world are desperate for crude oil. The big winter demand season for distillates is just getting under way, and stocks of light heating oils, diesel, and resid are tight.
- But refiners—particularly those in the U.S. and Europe—are overstocked with gasoline. And until this is worked off, there is little hope for any widespread upward adjustment in the big-volume gasoline prices.

The price hikes that are needed to offset costs go all the way back to the wellhead, oil men say. Many predict that U.S. crude prices will have to move up—some say before the end of the year.

But just how postings for crude can be increased—and by how much—presents a second strange paradox. All buyers want more crude. This week's purchaser nominations to the Texas Railroad Commission give a good indication of just how badly crude is needed.

But it's not just a matter of increasing allowable producing rates. Too big an increase just now would solve nothing. In fact, it would make matters worse.

A big boost in producing rates would just mean that oil would back up in lease storage for lack of pipeline outlets to Gulf Coast loading ports. The tightest pipeline movement is from West Texas. And that's where the biggest part of the state's excess producing capacity is located. At most, oil men estimate, only 80,000 b/d of additional oil could be moved out of West Texas to the Coast, by added pumping capacity to beef up capacity of existing pipelines.

The only real spare pipeline space out of West Texas is to the Midwest.

Louisiana Boosts November Allowable

Louisiana decided this week to boost its previously set November allowable by 75,000 b/d, to 809,888 b/d. The state conservation commission also decided at a meeting Monday to boost the December allowable by 25,000 b/d more, or to 834,888 b/d.

The new allowables for November and December establish new all-time highs for the state. The previous peak was 788,778 b/d, last April.

In East Texas there is approximately 100,000 b/d of "surplus" pipeline capacity to the Gulf Coast. But there's little if any "surplus" oil to fill up the lines.

The upward pressure on costs are twofold: (1) the pre-Suez demand by U.S. producers for higher crude prices to offset increased finding, drilling, and producing costs; and (2) the added post-Suez bottleneck in transportation, causing, among other things, expensive backhauling.

For example, to move the excess crude from West Texas and New Mexico to where it's needed on the Gulf Coast involves some strange routings. Some of the crude is being pipelined to Oklahoma, from where there is idle line capacity to the Gulf. Some West Texas crude is even being lined up for movement by pipeline to the Wood River (Ill.) area, where it can be barged down the Mississippi.

Also there are about 50,000 b/d of West Texas crude now being moved by tank truck at the expense of the producers.

Some companies are giving consideration to laying pipeline connections to eliminate the costly truck movement. Other buyers are thinking of absorbing the added trucking costs in order to be assured of more supply.

Such devious routings even extend to worldwide tanker movements.

For example, one Gulf Coast refiner, who had been importing around 25,000 b/d of Middle East crude, has

turned the crude back to British Petroleum. The buyer also turned over its tankers to BP so BP could fill its commitments in Europe.

British Petroleum has been forced to suspend some contracts with other U.S. purchasers for the rest of the year. This serves to confuse the picture and to tighten crude supply even further.

Another example is at the eastern Mediterranean.

Tapline—the outlet for Saudi Arabian crude on the Mediterranean—is the only Middle East transit pipeline still open to supply Europe. Yet oil shipments from that pipeline to either Britain or France—the major European oil consumers—are barred by the Saudi Arab government.

Thus, it's not inconceivable that a good part of Tapline's oil may have to be routed to the U.S., and U.S. oil, in turn, shipped back to Britain and France.

Ingenious pipeline and tanker movements to get crude to European and U.S. East Coast refineries solve only one part of the problem. The refiners still can't figure out how to unload heavy gasoline in storage. And the more crude that's run to make heating oils for Europe, the greater the chances for more gasoline ending up in inventories.

U.S. suppliers would be happy to furnish European buyers with either crude or fuel oils—the most-wanted petroleums there. But this does nothing to correct the U.S. gasoline oversupply, which would be further aggravated if mostly fuel oils have to be supplied.

But Europe has its own gasoline surplus. And even if the Middle East crisis lasts long enough to draw down this surplus, most U.S. gasoline is far too high in quality and octane rating for European vehicles.

So far it's been a stand-off situation. But this week there were indications that at least one European buyer—BP—may be willing to buy U.S. gasoline if it can get some fuel oil at the U.S. Gulf.

Along with these upward pressures on crude oil prices, there are also important counter pressures at work. There are strong indications, for example, that the U.S. Administration would take a dim view of any increase in U.S. crude oil prices while Europe is in a bind.

Also, U.S. oil companies with European affiliates are deeply conscious that a price rise now—at a time when Europe is having a hard enough time trying to finance dollar oil at present prices—would be bitterly resented in Europe as "oil profiteering."

The question of whether or not the U.S. will help the European countries foot their costly additional dollar oil bill has not yet been settled. As of this week, the U.S. government has made no concrete move in this direction.

If the U.S. Government does decide to help foot Europe's bill with U.S. taxpayers' dollars, the pressure in Washington against a general crude price rise during that emergency would be even greater.

The really big question is: How long will the oil crisis actually last? Some industry quarters are counting on a shutdown of Middle East pipeline and canal facilities for a minimum of six months.

But there are indications that, once the present shaky "peace" stabilizes sufficiently to appraise the damage to the pipelines and the canal, the British will be ready to take almost any costly emergency action that proves necessary to reopen these facilities as quickly as possible. Reason: Such steps will be far cheaper than buying dollar oil any longer than necessary.

So far, all communications with Syria have been cut off, and engineers have not been able to inspect the damage to the three pump stations blown up on Iraq Petroleum Co.'s pipeline from Iraq to the Mediterranean.

Once the company engineers get in, there is no doubt whatever that IPC will spare no costs, and will fly in any equipment necessary, to repair the lines quickly.

In the case of the Suez Canal, too, emergency steps can be taken to speed the reopening. For instance, it would be far cheaper for the British to purchase and blow up ships blocking the canal than to take the time to raise them and tow them out.

The crisis may be a lot shorter lived than expected. And the U.S. is running some danger that, in preparing for a six-months' or longer crisis, it may wind up with an even bigger surplus on its hands.

On the other hand, if the crisis is long-lived enough to eat up the surplus in the U.S., the industry would then be in a position to get its desired price increases.

What They're Saying at API

L. F. McCollum, president, Continental Oil Co.

"The greater the degree of decentralization, the greater is the need for good management controls. Conversely the better the controls, the greater the degree of decentralization that is possible."

Frank Porter, president, American Petroleum Institute

"Product shortages in Western Europe will result from a decision to use available tankers to haul in crude, rather than to depend on the U.S. and other Western Hemisphere nations to supply additional products."

John F. Simms, Governor of New Mexico

"Our Oil Conservation Commission isn't going to be a sitting duck for federal sharpshooters. If the Dept. of Justice plans to 'pioneer in the supervision of state regulatory bodies,' I would suggest that they plan to pioneer somewhere else. They're not going to do it in New Mexico!"

Richard Rollins, retiring chairman, Oil Industry Information Committee

"What people are not sure about is whether the oil industry has the public interest at heart. So the 1957 OIIC program will be geared to placing more emphasis on ethical, moral, and social contributions."

Dwight T. Colley, marketing vice-president, Atlantic Refining Co.

"When the dealers tell us what we can do to help, we mustn't be afraid to discuss it."

Lowell Stanley, director, Monterey Oil Co.

"A reduction or elimination of the depletion allowances, relying on what they call the price mechanism, would create forces tending toward the contraction of crude production. In fact it could go far toward limiting, and perhaps even eliminating, the segment of the industry that we represent, the independent distributor and marketer."

R. J. Gonzalez, vice-president, Humble Oil & Refining Co.

"The suggestion that we use foreign oil when it is available and cheap and conserve our oil . . . overlooks the impact of imports on domestic exploration and drilling."

CORRIDOR CONFERENCE at Conrad Hilton Hotel involves (left to right) Rip Underwood, Amarillo independent producer; Lawrence Hagy, The Hagy Co., Amarillo; J. Ed Warren, vice-president, First National City Bank, New York; Joe Bridwell, Wichita Falls independent; and Robert L. Wood, Midland, president, Independent Petroleum Assn. of America.

Random Shots at the API Meeting

TOP MEN AT API: Jake L. Hamon, Dallas, chairman, and Frank M. Porter, New York, president.

HOUSTONITES Ben C. Montgomery, M. J. Crose Mfg. Co., and R. A. Brannon, corrosion engineer, Humble Pipe Line Co.

PRODUCTION MEN: William H. Strang, Dallas, director, API's Division of Production; and A. W. (Tommy) Thompson, Houston, retiring vice-president for production.

PIPELINE GROUP, operating section, of API's Division of Transportation, meeting at Palmer House, with R. H. Lynch (center), Philadelphia, Atlantic Pipe Line Co., presiding.

NOJC May 'Go to Government'

For years, jobbers have talked about "going to the government" to get relief from some of their jobber-supplier woes. Now they have set up a committee that's authorized to do it.

The National Oil Jobbers Council is going to take its problems to the government—unless suppliers act on those problems soon.

Last week NOJC set up a committee to meet with government agencies —"national, state, and local"—to discuss what it calls "certain practices in the oil industry which create unfair and unsound competitive conditions for the oil jobber."

The council established the committee in a resolution passed at its annual meeting in Chicago. Assignments to the committee have not yet been made.

Clint Elliott, NOJC president, opening the annual meeting, told the jobbers that "it is past time for the jobber to protect his business and his family from financial ruin, by all legal means."

The jobbers could ask for an investigation of marketing. The new NOJC committee is authorized "to ask for a thorough investigation of the marketing segment of petroleum industry if deemed appropriate after discussions" with government agencies.

But the request for government intervention will be dropped if the jobber position is improved. NOJC has given itself an option: The new committee can defer action "if at any time the practices referred to have been eliminated or appear to be in the course of correction."

Some jobbers say that NOJC is offering suppliers "one more chance" before asking for government help. One jobber told PETROLEUM WEEK that, "We've made threats of taking our troubles to the government before, but this time we've set up machinery to do it. Still, we'd rather settle these things within the industry —where they belong."

Primarily, the jobbers want some kind of margin hike from suppliers. NOJC's economic concentration committee, which fathered the request for government aid, makes this case for higher margins: "Jobbers' operating costs—including labor,' transportation, equipment, and real estate —have risen an average of 20% since the last general margin increase in midsummer of 1953."

In another resolution passed at the meeting, NOJC urged suppliers to "make a thorough re-study of their contract arrangements with jobbers."

NOJC doesn't pinpoint the "certain practices" it feels must be corrected. But the jobbers have been making the same complaints for a long time: They contend that some suppliers are "pirating commercial accounts; subsidizing marketing operations out of their depletion allowance; and tieing up jobber capital by insisting on the present system of gasoline tax collection."

Suppliers have, from time to time, denied all of these charges.

At this point it's hard to tell how much help the jobbers would get by going to the government.

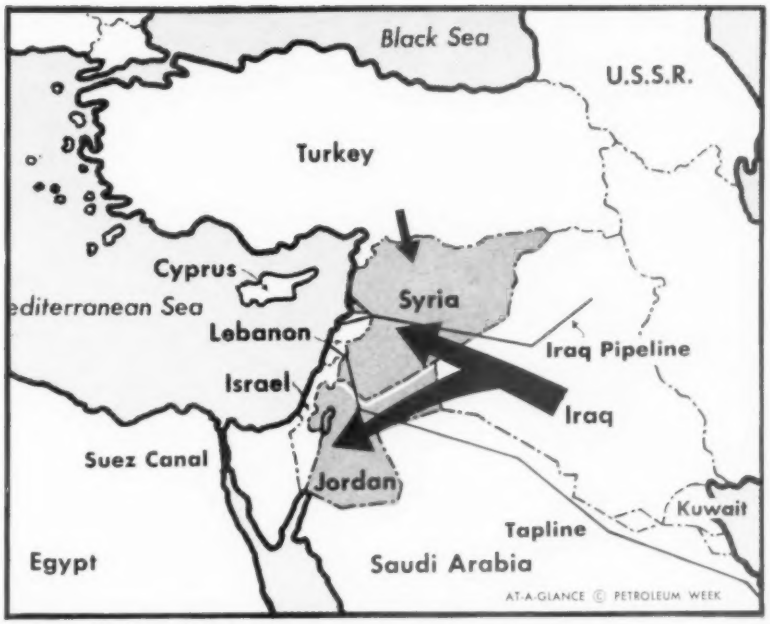
On the national level, the jobbers would probably discuss their problems with Federal Trade Commission representatives or congressional committee chairman.

What these various groups could do for the jobbers—apart from the general investigation of marketing—is open to question.

Otis Ellis, NOJC's general counsel, told the jobbers that any action from the government would come only if jobbers "cooperate in supplying all the facts we'll need. Every jobber will have to put his shoulder to the wheel. When the time comes, be ready to back up what you've done today."

Three New API Vice-Presidents Chosen

The American Petroleum Institute, meeting in Chicago this week, elected three new vice-presidents to head up three of its divisions. They are, left to right, Don L. Connelly, Warren Petroleum Co., vice-president for production; Dwight T. Colley, Atlantic Refining Co., vice-president for marketing, and H. W. Ferguson, Humble Oil & Refining Co., vice-president for refining. Frank O. Prior, Standard Oil Co. (Ind.) was reelected vice-president for transportation.



MIDDLE EAST UNREST has Britain in a swivet. Does the answer lie in . . .

A New Middle East Map?

A Special Report to PETROLEUM WEEK from the Middle East

The map of the Middle East could look considerably different if an idea the British are reported mulling over ever materializes.

The general idea is to stabilize the turbulent area at the eastern end of the Mediterranean—by extending the boundaries of Iraq and Turkey to absorb Syria and Jordan.

Western sources say this redrawing of the Middle East map is more than wishful thinking by the British; that some British officials are blueprinting such a plan, and will press for it vigorously.

Furthermore, these sources say, it is a step England wants taken regardless of the immediate outcome of the current struggle in the Middle East.

The British are reported to be thinking along these lines: Iraq would annex Jordan, while Syria would be split between Iraq and Turkey (map).

No specifics of the proposed division of Syria are available, but the tentative plan appears to be this:

- Turkey would take a relatively small slice of upper Syria, but it would include the big, key city of Aleppo.
- Iraq would get the larger portion of Syria, including the Mediterranean coastline, the port city of Latakia, and Syria's capital, Damascus.
- Banias, the oil pipeline terminal, would also fall in Iraq's domain.

Under such an alignment, Iraq's annexation of all of Jordan and part of Syria would extend Iraq's border to Israel and the Mediterranean Sea.

Israel and Lebanon would continue as they are.

The British planning regarding Syria and Jordan has been intensified by the fact that Egypt is so deeply involved at home with its own problems that it might be unwilling, or unable, to oppose the British-backed move at this time.

There are two principal reasons for the British plan:

- **All pipelines from the Middle East cross one or both of these countries.** The IPC pipelines and Tapline go through Syria, and Tapline also runs through Jordan. Since England needs that oil badly, it would breathe easier if the two nations were in friendlier hands.

- **There has been a rapid growth of anti-West feeling in both these nations.**

Syria is so Communist-infiltrated that it has become virtually Communist-dominated.

Anti-Western elements have extended their influence to key places in each nation's legislative and administrative departments.

This has grown to such an extent that the British fear not only for the pipelines, but for their over-all strategic commercial and political future in that region.

The failure to get Syria and Jordan to join the Baghdad Pact is another sore point with the British.

This failure can be traced largely to the embittered anti-Western feelings among the Arabs resulting from the Palestine war of 1948. Since then Egypt and Saudi Arabia have actively backed nationalist elements in their opposition to Britain and Iraq.

Obviously, there will be bitter opposition to the British plans for Syria and Jordan.

Iraq, Turkey, and England—particularly the latter two—are very unpopular in the other Arab countries.

As far as Iraq is concerned, there are some elements in both Jordan and Syria who would favor a union with Iraq. But not if they believe that England and Israel have a hand in it.

On the other hand, there is no support at all in Syria for any annexation by Turkey.

Many Syrians still chaff over the Turkish annexation of Antioch and the Syrian port of Iskenderun in 1938, while Syria was still a French mandate. Syria has never recognized this "grab."

Saudi Arabia is certain to bristle over any expansion move on Iraq's part. It has eyed with some misgivings Iraq's obvious dreams of enlarging its empire. And any move by Iraq to take over Jordan and a big slice of Syria would stimulate fresh resentment.

Iraq and Saudi Arabia, long-time rivals, apparently have been making some progress toward working together on better terms. The British plan would put an end to that harmony.

Israel itself might oppose the British plan. It has been against earlier attempts to build an Arab union, maintaining that such a move would imperil Israel.

Israel might agree, however, if it gets assurance of protection from the British. Anyway, as one observer puts it, what could Israel do if England were to go ahead with its plan?

It is not yet apparent what action might be taken to set the stage for an Iraqi move into either Syria or Jordan.

There might be a series of "incidents" which would "provoke" Iraq into attacking Syria.

Or, in a case of growing tension between Israel and Syria, Iraq might occupy Syria as a "protective" move.

In any event, there is little doubt that England will not be content until the current situation in that region is "stabilized" in some way.

First nine months of '56

How Oil Companies Fared Financially

(Figures in thousands of dollars)

EARNINGS LEADERS	Gross Income			Net Income		
	1956	1955	% change	1956	1955	% change
Gulf				$206,269	$145,287	+42
Atlantic	401,291	$ 375,465	+ 7	32,691	24,368	+34
Cities Service	721,608	672,386	+ 7	43,491	34,300	+27
S. O. (Ohio)	291,265	269,520	+ 8	20,159	16,306	+24
Seaboard				7,530	6,104	+23
Socony Mobil				183,000	150,000	+22
McColl-Frontenac				9,335	7,730	+21
Imperial				51,138	42,522	+20
Sinclair	874,496	799,720	+ 9	66,032	56,138	+18
Shell	1,192,575	1,087,262	+10	100,144	85,646	+17
Int'l Petroleum				28,700	24,600	+17
S. O. (N. J.)	5,375,000	4,698,000	+14	603,000	523,000	+15
Plymouth Oil				5,984	5,210	+15
S. O. (Calif.)	1,137,158	1,008,329	+13	190,355	166,272	+14
Continental	431,234	392,992	+10	39,142	34,455	+14
Sunray Mid-Continent				31,400	27,708	+13
S. O. (Ind.)	1,410,244	1,308,047	+ 8	114,991	102,783	+12
Tidewater				30,091	27,256	+10
Phillips	760,071	660,405	+15	71,570	65,189	+10
Texaco				207,429	189,767	+ 9
Creole				240,610	220,159	+ 9
Sun				39,797	36,972	+ 8
Pure Oil				26,210	24,650	+ 6
Union of California	294,660	272,915	+ 8	26,107	25,094	+ 4
Ohio Oil	205,975	190,975	+ 8	30,296	29,193	+ 4
Honolulu Oil	31,543	26,275	+20	10,588	10,328	+ 3
Skelly	185,983	167,353	+11	23,345	22,815	+ 2
S. O. (Ky.)	214,196	203,738	+ 5	9,561	9,546	+ 0.2
Richfield (L. A.)	187,567	182,164	+ 3	20,769	22,665	— 8

Earnings Climb Loses Some Speed

Net profits of big oil companies still appear headed for a record year. But the rate of rise flattened out somewhat in the third quarter.

Most of the oil companies are pleased with their earnings gains in the first nine months of 1956 (table). These increases are especially encouraging in view of the fact that total U.S. corporate profits, before taxes, actually declined.

Although third-quarter net profits for most of the companies topped 1955 figures, the percentage of gain over 1955 for about two-thirds of the companies was lower at the end of nine months than at the end of six months.

Main reason for this failure to keep pace is that July, August, and September of this year are compared with a very favorable third quarter of 1955. The auto industry was in a record boom last year. And farm areas did not suffer so much from droughts in 1955 as they did this year (when farm oil demand was reduced).

Furthermore, increased oil-company costs this year (including higher wages and steel prices) haven't been matched by corresponding rises in crude and product prices.

Despite these factors, the percentage gains in earnings of a few companies, such as Cities Service, Union of California, and California Standard, were actually higher at the end of nine months than at the end of six this year.

The trouble in the Middle East may hurt the fourth-quarter earnings position of some oil companies operating overseas. But it may help domestic oil companies.

With the Suez Canal closed for several months, crude transportation will be more costly for the foreign operators.

However, on the other hand, new demand for U.S. crude from Europe could ease the oversupply position here, and raise domestic allowables. Some U.S. producers earlier had feared a further lowering of allowables during the present quarter.

Also, refiners in this country stand to benefit from any boost in the European demand for products, which would have a strengthening effect on prices.

Over-all, the earnings outlook for the full year is bright because U.S. demand is continuing strong, and prices are generally holding in the face of loose supplies of crude and products. Total petroleum demand this year is running 6% ahead of 1955. The basic explanation for all the plus-signs in nine-month profits is that oil companies are producing, refining, and selling more oil than ever before.

Typical comment on 1956 through September comes from Continental Oil (net profit up 14%): "The improvement is largely attributable to an increase of 3.4% in crude production, to an increase of 5.9% in sales of refined products, and to higher price realizations on certain products."

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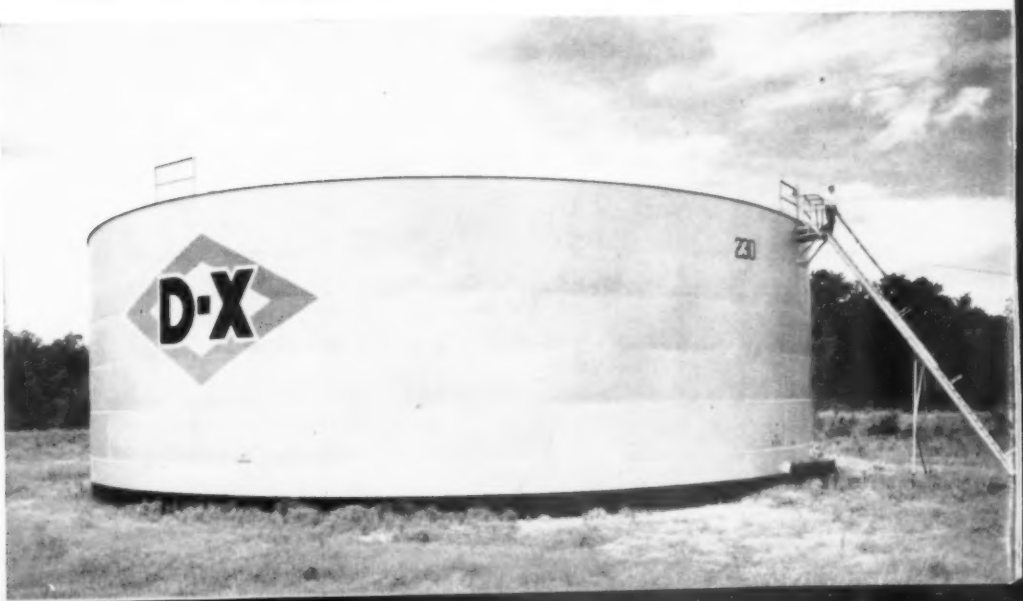
gave these 80,000-bbl. tanks a vapor-stopping seal of "Microballoon" spheres in April, 1954, about 4500 lb. per tank. Some 1,500,000 bbl. per year have since been pumped through each tank. Tanks handle sweet crude with a high gravity—about 37 to 45 API. Gas content is 40 to 50 per cent.

SOHIO
has had this five-tank farm equipped with "Microballoon" spheres since October, 1953. Farm capacity is 400,000 bbl., four tanks operating on a seven-day cycle with 7 RVP oil. Fifth handles 4 to 5 RVP on a 23-25-day cycle. Pipeline rate is 40,000 bbl. per day.

D-X SUNRAY
equipped this 35,000-bbl. working storage tank with "Microballoon" spheres two years ago. Pumping or receiving 80 per cent of the time, the tank handles select crude and mixed crude — casinghead gasoline. About 5,000,000 bbl. have been pumped through since the vapor seal was installed.



SINCLAIR is testing this "Microballoon" sphere covered tank along with a control tank, figures a 50 per cent saving. Tank's discharge is 2,000 bbl. per hour with five turnovers per month. Average temperature is 75 deg. F., RVP is 5.6 psi. Now other tanks at this site are due for the vapor-sealing treatment.

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What El Paso-Pacific Deal Means

El Paso Natural Gas Co.'s proposed acquisition of Pacific Northwest Pipeline Corp. puts a dramatic new twist into competitive conditions in the oil and gas industry.

The deal had been hammered out in secret sessions this month in Houston. Some news of the daring venture leaked out (PW—Nov.9'56,p5).

But it wasn't until late last week, when both sides announced full details of the plan to make Pacific Northwest an El Paso subsidiary, that the full scope of the new alignment could be analyzed.

One of the obvious results is that El Paso will be one of the biggest gas transmission firms in the world if the deal goes through.

The two companies have reserves in almost every major gas field from West Texas to Wyoming (map), and in Canada.

Their main lines alone, existing and under construction, stretch about 8,500 mi. Total capacity is up to 3.2-billion cu. ft. daily.

And El Paso will now be the only major gas supplier in New Mexico, Arizona, Utah, western Colorado, southwestern Wyoming, Idaho, southern Nevada, Washington, Oregon—and the huge California market.

The big impetus to El Paso's proposal is the need for new reserves to supply present customers—particularly in California.

El Paso needs at least 850-million cu. ft. per day more by 1959. The company has 100-million cf/d of this lined up in Canada. It also has untapped reserves in Wyoming. But in both areas, it's Pacific Northwest that has the facilities to transmit the gas.

Pacific also has a 25% interest in Westcoast Transmission Co., Ltd., the currently-building Canadian line that will be linked with Pacific Northwest next year. Pacific is authorized to take up to 300-million cf/d at the Canadian border, after Westcoast completes its trunks. And Pacific is now angling to hike its imports to 500-million cf/d. The already-authorized imports include the 100-million cf/d consigned to El Paso.

Before the new pact, El Paso had planned to get its gas by selling the Canadian and Wyoming quantities on the spot daily to Pacific Northwest, and by buying like amounts of Pacific Northwest reserves in the San Juan Basin, where El Paso has pipe.

Uniting the systems would give both companies more efficient and more flexible gas routes. Reserves at either end or in the middle of the combined systems would be piped to the closest marketing areas, without the complications of competing interest and daily exchange deals.

8,500-MI. NETWORK would result from acquisition of Pacific Northwest by El Paso.

The deal would also put El Paso into a better long-range expansion position—particularly in California.

Ever since El Paso failed to block the Pacific Northwest project, the company has been trying to figure a way of tapping the new trunk for its own expansion purposes in California.

Just prior to the new agreement, however, it looked as though Pacific Northwest intended to "invade" California on its own—with a lateral from one of its regional trunks to the San Francisco Bay area. Now, if the plan materializes, it will be with El Paso's blessing.

El Paso would also have new interests in the Midwest, via Pacific Northwest's agreement to sell gas to Colorado Interstate Gas Co., which, in turn, expects to tie in with Natural Gas Pipeline Co. of America's trunk to the vast Chicago market.

The proposal, in addition, puts new strength into the likelihood that Four Corners crude and gas liquids will flow northward to the Salt Lake valley.

Both El Paso and Pacific Northwest, along with several other companies, have advanced competitive plans for crude and products lines out of the San Juan and Paradox basins (located at the intersection of Utah, Colorado, New Mexico, and Arizona).

El Paso contemplated a line to Los Angeles. But Pacific Northwest took the lead by forming a new subsidiary and forging ahead with a plan that included both a line to Salt Lake City and refinery and marketing outlets (PW—Sep.28'56,p12). Phillips Petroleum Corp., with production in the Four Corners and a refinery in Salt Lake, backed the plan.

Shell Oil Co. and Standard Oil Co. of California, nevertheless, came up with a plan to link the Four Corners with Los Angeles. And the Texas Co. proposed still another direction—to Galveston (PW—Oct.12'56,p12).

Having tied up with Pacific Northwest, El Paso now favors the Salt Lake direction, says a company spokesman. With El Paso liquids flowing northward along with Pacific Northwest's, plus the amount committed by Phillips, this line would be fully justified.

If the crude line is built to Salt Lake, there is a strong likelihood that refined products would be piped eventually from Salt Lake to the

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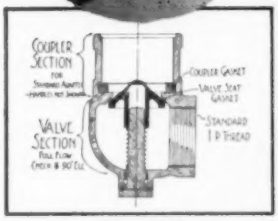

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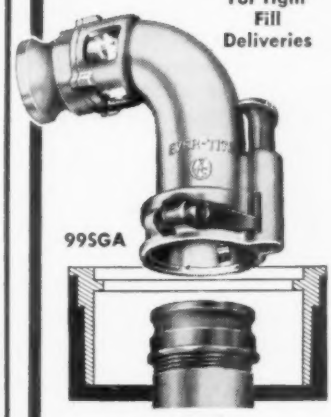

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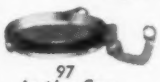

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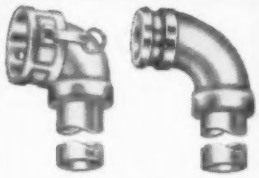

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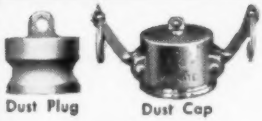

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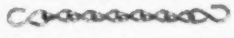
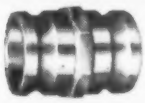


Chain for attaching Dust Caps or Dust Plugs to adapters or couplers



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West Coast. The "interior" market isn't big enough to take up all of the products that would be made in Salt Lake as a result of the new line.

This explains Standard's concern to move crude directly to the West Coast from the Four Corners, and Texaco's equally strong interest in linking the Four Corners to Texaco's own refining area.

The actual details of the proposed El Paso-Pacific Northwest deal are strikingly simple: El Paso would "buy" Pacific Northwest's common stock with a new issue of its own common stock.

The basic proposal is this: On Dec. 21, El Paso will ask its stockholders for permission to issue some 2.6-million shares of a new "B" common stock. These would not pay dividends until 1958. Seven of these shares would be offered for each eight shares of Pacific Northwest outstanding. El Paso would have to be able to round up at least 80% of Pacific's 3-million shares or the deal would be off.

If El Paso stockholders approve, the offer will be made to Pacific Northwest stockholders about Jan. 15. Pacific's directors have already pledged the 1.2-million shares they control; so OKs must still be obtained from holders of at least 1.2-million of the other 1.8-million shares.

There's a slight technical complication. Also on Dec. 21, El Paso will propose to its stockholders a 2-for-1 stock split Dec. 21, which would also double the proposed "B" issue. In that case, the exchange rate with Pacific stockholders would be fourteen El Paso shares for every eight of Pacific.

Prime inducement to Pacific stockholders is that they would then hold shares in a bigger, longer-established company, with the advantages of wider expansion and without the necessity of declaring any profit for income tax purposes.

They would be getting "kind-for-kind"—shares for shares—and would be subject to no tax until they sold the new stock. As for the lack of dividends next year, they're not due for any anyway.

Present Pacific management would remain intact.

Theres' a possibility that the deal would be subject to Justice Dept. scrutiny. A 1950 amendment to the Clayton antitrust act gives the department the right to look into such stock-swaps.

But, unlike most pipeline mergers, the union would not come under jurisdiction of the Federal Power Commission, according to some experts.

What's New / IN THE INDUSTRY

Mideast Crisis Delays Oil Imports Action

The Eisenhower Administration, which had its back to the wall on the imports question, has been given a breathing spell by the Middle East crisis.

Defense Mobilizer Arthur Flemming had said he would decide by Dec. 1 whether to recommend that President Eisenhower impose mandatory restraints. He said his decision would be based on estimated 1957 imports—to be submitted by Nov. 8—and on additional company statements by Nov. 25.

However, when the Suez Canal was blocked and the IPC pipelines put out of action, the U.S. imports question became moot—at least for a while.

Socony Mobil Oil Co. stressed this in its report to Flemming. "It is quite apparent that the Middle East emergency will cause a far greater reduction of oil imports into the U.S. than has been recommended by the Cabinet committee," A. L. Nickerson, Socony Mobil's president, told Flemming.

Nickerson predicted that it would take several months to restore normal schedules even after the Middle East situation is cleared up.

ODM officials agree that Flemming's decision will be postponed.

The Middle East developments have prompted independents to renew their argument that Middle East oil is not really cheap after all. The Independent Petroleum Assn. of America says the relatively low cost of crude production in the Middle East is offset by millions of taxpayers' dollars spent in the area for foreign aid, airport construction, and tax concessions —"all for protection of a foreign oil supply."

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Bond Issues Pass

Voters in two states approved $600-million in highway bond issues at the Nov. 6 election (PW—Oct.26'56, p11).

- New York—Voters gave state authorities the green light for a $500-million highway construction program.
- Kentucky—A $100-million highway bond issue was approved by a substantial majority.

Other issues affecting oil, decided in state elections, included:

- Nebraska—A ton-mile tax levy on trucks failed by a 3:2 ratio.
- Georgia—A $250,000 bonus for the first commercial well producing 100 b/d was OK'd. Bonus had been $100,000 for 250 b/d.
- Montana — Antidiversion amendment was passed, bringing the number of states that prohibit diversion of highway funds to 27.

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The bitter campaign battle over California's Proposition 4—the oil and gas conservation act—is over. And oil men are hoping that the intra-industry fight will soon be forgotten.

California voters overwhelmingly defeated the oil pool unitization measure by a three-to-one margin. The vote climaxed one of the most expensive campaigns for an initiative measure in California's history. Estimates of the total amount spent for and against the bill range up to $10-million.

The proposition had the heaviest vote of any of the 19 measures on the state ballot.

•

The Oil, Chemical & Atomic Workers Union hasn't yet specified what its wage-hike target in the U.S. will be—but it is seeking a 12.5% increase in Canada.

The Canadian goal also includes a request for shift differentials of 15¢ and 20¢, double time for all overtime, and premium pay for regular Sunday work for shift workers.

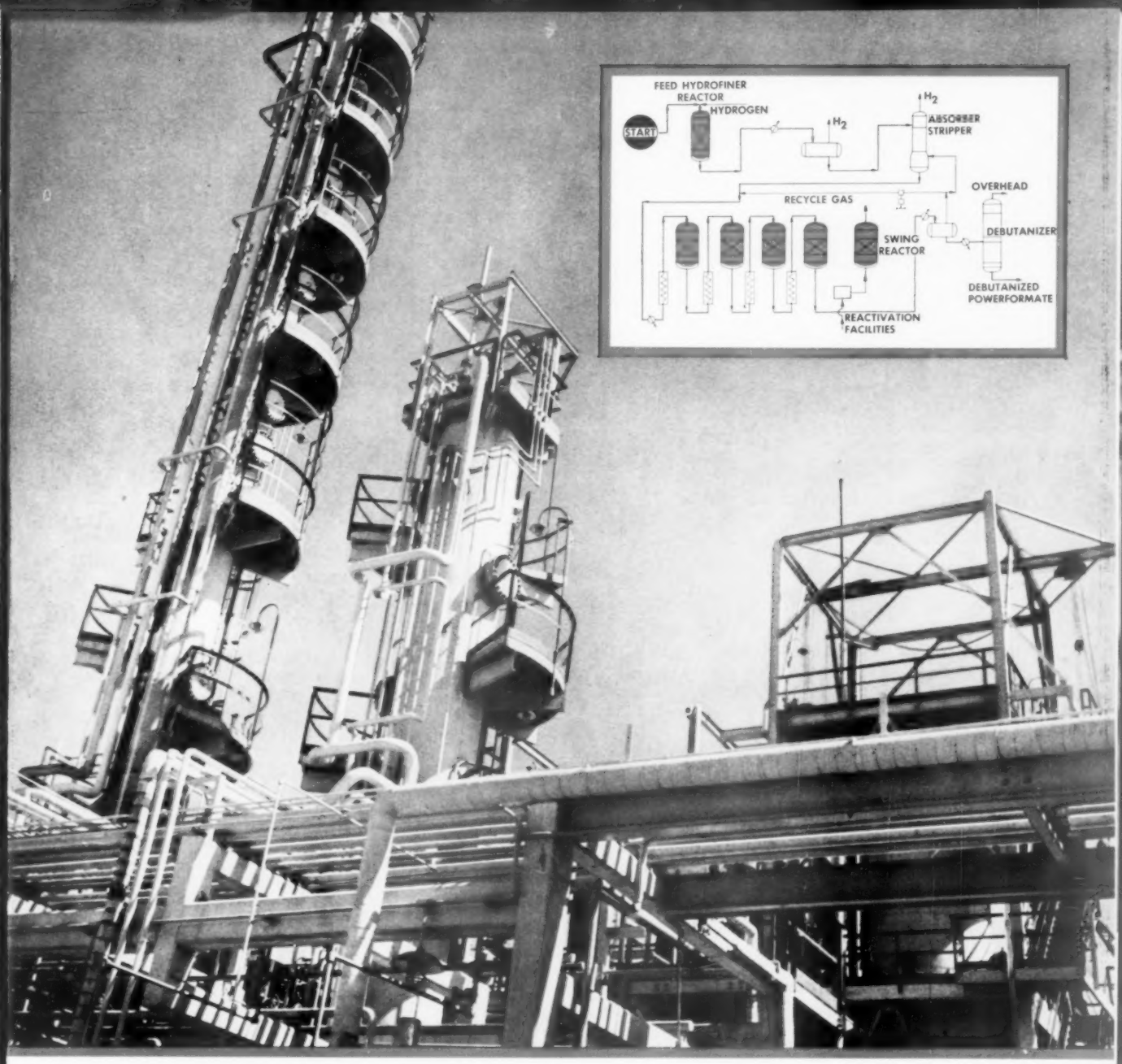
In the U.S., several independent oil unions have launched pay-increase drives ranging from 9% to 15% (PW—Nov.9'56,p13). OCAW, however, has only said that it will seek "substantial" increases.

•

A Humble Oil & Refining Co. geologist says his company has found California as profitable an exploration area as West Texas.

Ed J. Hamner, director and manager of Humble's exploration department, says Humble's discovery costs in California compare favorably with such costs in West Texas, at "just a little over a dollar a barrel."

Hamner spoke last week in Los Angeles before the Pacific section meeting of the American Assn. of Petroleum Geologists.



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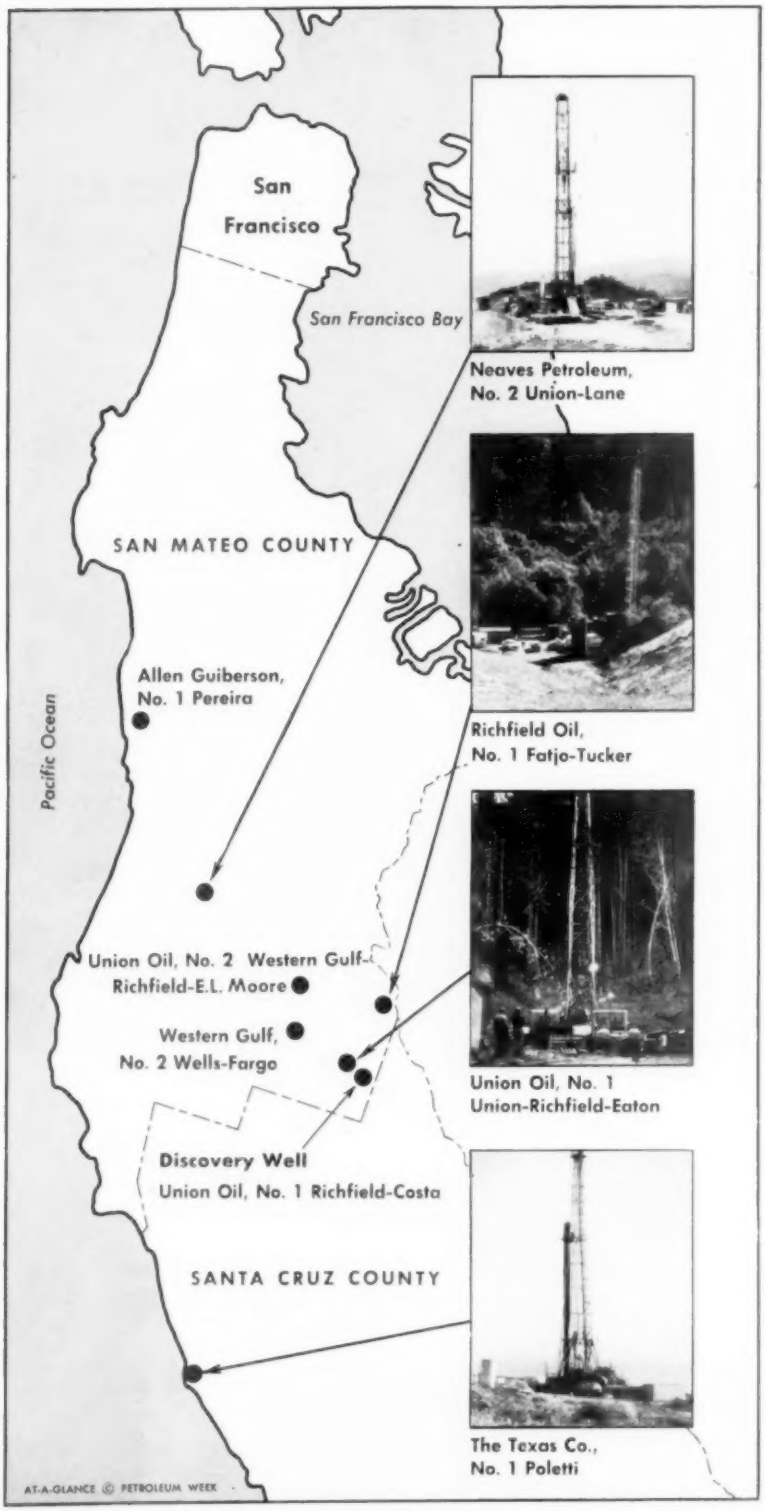
Santa Cruz Basin Lures Wildcatters


San Francisco
San Francisco Bay
SAN MATEO COUNTY
Pacific Ocean
Allen Guiberson, No. 1 Pereira
Union Oil, No. 2 Western Gulf-Richfield-E.L. Moore
Western Gulf, No. 2 Wells-Fargo
Discovery Well
Union Oil, No. 1 Richfield-Costa
SANTA CRUZ COUNTY
Neaves Petroleum, No. 2 Union-Lane
Richfield Oil, No. 1 Fatjo-Tucker
Union Oil, No. 1 Union-Richfield-Eaton
The Texas Co., No. 1 Poletti
AT-A-GLANCE © PETROLEUM WEEK

An unprecedented boom is shaping up in the Santa Cruz Basin in California's Santa Cruz and San Mateo Counties, south of San Francisco. At last count, seven wildcats were going, or planned, by majors and independents.

The current activity compares with a total of only five exploratory wells drilled in all the three year period of 1953, 1954, and 1955.

Discovery of new production at Oil Creek, in San Mateo County, is expected to give new impetus to the boom.

Neaves Petroleum Developments' No. 2 Neaves-Union-Lane, section 17-7s-4w, on production test showed 75 b/d of high-gravity oil from total depth of only 1,763 ft.

The well is 6 mi. northwest of the Oil Creek discovery, made about a year ago, and is evidently tapping the same zone—Butano in the Eocene.

Neaves had a lot of trouble with circulation and also had given up on a dry hole nearby at 4,200 ft. But the strike, hailed as best in the country since the discovery, makes the cost and effort seem worthwhile.

Other wildcats, drilling or planned (map), are:

- Allen Guiberson, of Dallas, operator, No. 1 Pereira, section 9-6s-5w, at Half Moon Bay, location graded, waiting on rig.
- Richfield Oil Corp., No. 1 Fatjo-Tucker, section 26-7s-3w, near Oil Creek, fishing at 1,169 ft.
- The Texas Co., No. 1 Poletti, section 13-10s-4w, at Davenport, drilling below 6,865 ft.
- Union Oil Co. of California, No. 1 Union-Richfield-Eaton, section 10-8s-3w, near Oil Creek, drilling below 3,535 ft.
- Union Oil Co. of California, No. 2 Western Gulf-Richfield-E. L. Moore, section 31-7s-3w, at Peters Creek, location graded, waiting on rig.
- Western Gulf Oil Co., No. 2 Wells-Fargo, section 7-8s-3w, southeast of La Honda, waiting on rig.

And within the past few weeks, Seaboard Oil Co. abandoned No. 1 Atkins, section 22-9s-4w, at Ano Nuevo Creek, at 3,537 ft. after bottoming in shale.

The current drilling boom appears to be, in large measure, a belated follow-up to one of last year's most intriguing oil discoveries in California.

Union Oil Co. of California made the discovery in October, 1955, in a

joint venture with Richfield Oil Corp. The strike was made at Oil Creek, 15 mi. southwest of Stanford University.

Union's No. 1 Richfield-Costa, section 14-8s-3w, was completed pumping about 75 b/d of 41-gravity oil from 2,094-190 ft., in the Butano.

When the discovery was made, Reese H. Taylor, Union board chairman, said the well "represents the first commercial oil production in the area and, in fact, opens up a new oil province to exploration. Although the initial rate of production is not high, the shallow producing sands and the excellent quality of the crude make the new find very attractive."

The discovery climaxed years of effort by various wildcatters, dating back to 1886, when oil exploration began on the basis of the many oil seeps in the area.

Rapid decline of the early wells—most of which were only a few hundred feet deep—kept the area in the background as more prolific fields were discovered in the San Joaquin Valley and the Los Angeles Basin.

Another factor in the present heavy activity is the undeniable fact that the Santa Cruz Basin contains many interesting prospects.

Oil seeps and structures that have not been tested combine to make an alluring proposition for operators weary of probing the duster-dotted fringes of California's older oil-producing areas.

The Santa Cruz Basin is a highly compressed structural and stratigraphic basin extending southward from Half Moon Bay through the rugged, heavily-wooded Santa Cruz Mountains, the San Andreas fault and, perhaps, southeast of the fault toward the town of Gilroy.

The Santa Cruz Basin has been prospected mainly on the basis of surface structures, though it is an area of anticlinal and faulted closures, permeability pinchouts, and offlap and onlap pinchouts.

Since Union's discovery, a growing number of geologists have been thinking in terms of stratigraphic traps, indicating that a new era may be dawning in the region's exploration.

Upper sequence of rocks includes the Monterey shales of Miocene age, the Santa Margarita sand, and sands and claystones of the Purisima formation of Pliocene age. Below the regional unconformity are sands and shales of Oligocene, Miocene, and Eocene age.

The relatively low price of leases in the area also has helped lure operators.

Five or six years ago, when majors began looking at the Santa Cruz Basin

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in earnest, acreage could be had in large blocks at a bonus of 50¢ per acre. Bonuses ran from $1 to $3 per acre prior to Union's discovery. Since then, they have run as high as $10 per acre.

Even at the new peak, many operators felt they could not afford to pass up the opportunity to pick up acreage in the basin.

But more than one operator who rode in on a bargain-price lease block has found the situation reversed when it came time to pick up the tab for drilling a wildcat.

Thick forests, steep hills, and winter rains are among the many problems which beset operators in the basin.

Some of the access roads to locations have cost as much as $60,000 to build—an almost prohibitive item on top of the cost of putting in the location. Companies are reluctant to spend money hard-topping a road to a wildcat before oil is discovered. "If it ever rains," says one trucker, "they'll be in trouble."

Union had such trouble last year, in attempting to drill its first offset to the Oil Creek discovery. Rain began falling almost as soon as the well was spudded. The location caught 41 in. of rain in 5 days, the access road was washed out, and crews had to be evacuated from the water-logged rig.

Lost circulation and hard shale are other drawbacks to rapid drilling of the new crop of wildcats.

Most of the upper beds through the basin are badly shattered and fractured. Lost circulation is painstakingly common as crews cut top hole. Surface pipe, as a result, must be cemented at comparatively great depth in relation to total depth of the average well.

After they get out of the lost-circulation zone, drillers frequently start complaining that the hole wanders everywhere except straight down. Texaco had to set whip-stocks at its Poletti wildcat, near Davenport, to keep its hole straight.

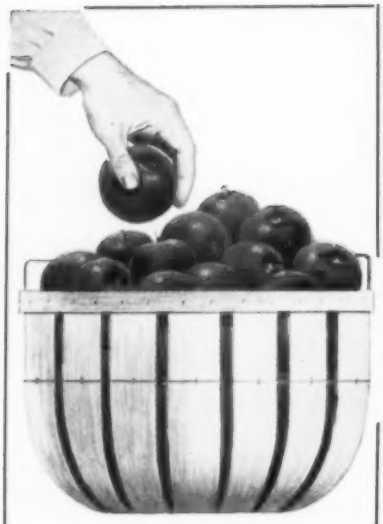
Other common complaints are lack of skilled help and long distances to supply and service centers. "No matter what you do," one contractor says, "you have to wait." Drilling is on a per-day basis—too few wells have been drilled in the area to permit bidding on a footage basis.

The recent discovery is expected to give new hope to wildcatters, who have drilled ten dusters in the two counties since the original discovery last year.

Before the Neaves strike, only one other producer—an offset—was completed in the field besides the Union discovery. It's too early yet to determine whether the Neaves discovery is an extension of the original pool, or whether it taps a new reservoir.

The new discovery also brings the field end of the oil industry up to San Francisco's doorstep. Though the city is headquarters for several large majors and independents, it has never felt the impact of major oil production.

But if a major field should be opened, the city has sufficient assets to underwrite any major developments.



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Humble Oil's Ragland says . . .

More Drilling Research Is Needed

There must be an "immediate and considerable" expansion of research in drilling if well costs are to be kept in check. That is the warning sounded this week by Douglas Ragland, chief petroleum engineer, Humble Oil & Refining Co.

Ragland urged the expanded program of research in a report prepared for delivery to a group session of the 36th annual meeting of the American Petroleum Institute, in Chicago.

Ragland's study showed that per-foot well costs have remained fairly steady since 1950.

"Many influences have contributed to the greater efficiency and the larger capacity of the drilling rig," Ragland says, "but the dominant one, it is believed, is the industrywide research and development effort."

Ragland based his findings on a study of Humble Oil's drilling costs over a five-year period.

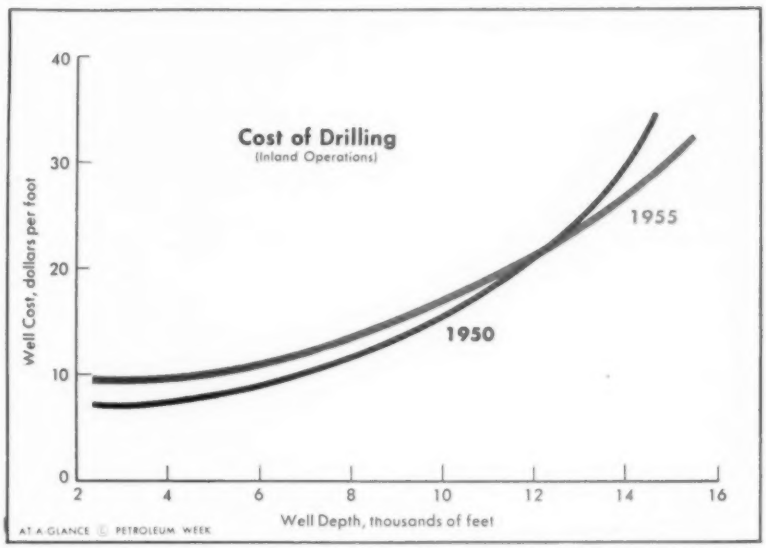
Accepting the Humble figures as representative (no regular and complete compilations of total well costs are kept by the drilling industry), Ragland says the data shows only a slight increase in the cost for shallow wells and an actual reduction in the cost of wells deeper than about 12,000 ft. (chart).

If you adjust the 1955 figures to take price rises into account, the figures show that total well costs decreased by from 10% for 3,000-ft. wells to 40% for wells in the 15,000-ft. range.

Up to now, Ragland says, funds for drilling research have been on the low side—last year, less than 1/3 of 1% of the gross business handled by the drilling industry.

The total industry expenditures for drilling research and development can only be estimated, Ragland notes. A limited sampling of tool and equipment manufacturers, drilling contractors, and oil operators places the domestic industry figure in the range of $12.5-million invested in such research in 1955.

Of this total, about $2.5-million went to pay for offshore projects. But because of their highly-specialized nature, offshore projects should be considered apart from the general field of drilling research, Ragland says. This leaves about $10-million spent by the industry in 1955 for general drilling research and development, compared with an estimated $3-billion of gross business handled by the industry in that year.



DESPITE INFLATION, per-foot drilling costs have risen very little since 1950—and for deep wells they're less now than they were then. Reason: successful research.

This small percentage of funds allocated to research compares with a range of 1%-6% of gross business spent on research by industry generally, Ragland notes.

On this basis, he continues, even 1% of gross business would seem to be on the low side. Yet it would mean an expenditure of $30-million annually —three times the present level.

But even if the present percentage of gross business is maintained, Ragland continues, the drilling industry will have to increase research expenditures from the present $10-million annually to about $16-million in 1965.

On the matter of average well depth, the Humble engineer says, a continuation of past trends is likely to be expected. This means the average well of 1965 is likely to be 4,550 ft. deep. This factor alone would tend to increase costs by about 20%.

Ragland quoted other estimates that, by 1965, the number of wells deeper than 10,000 ft. will nearly double the 1955 total, going above 4,000 per year.

"With only these two factors in mind, increased average depth and a larger proportion of deep wells," Ragland says, "it is reasonable to conclude that the cost of 72,000 wells in 1965 would approach $5-billion."

At the rate of 1/3 of 1%, this total gross would call for spending $16-million annually, exclusive of large expenditures for offshore projects.

Research has been successful in keeping well costs in check and in making important technical advances in the past five years, Ragland says. But more must be done.

On the basis of results gained, Ragland notes, the drilling research program has been successful. This is so despite the fact that, during the past decade or so, drilling research and development has failed to produce any single revolutionary or radical improvement.

But there has been an increasing stream of lesser, but significant, discoveries. These include advances in such fields as drilling hydraulics, bits and bit design, drilling muds, air drilling, slim holes, formation evaluation, and in over-all drilling equipment.

Some major challenges to research include:

- Determining the chemistry and physics of drilling fluids, to minimize lost returns, stuck drill pipe, sloughing formations, and plugged producing intervals.
- Resolving the simple and basic question of exactly how the rotary drill operates.
- Eliminating the difficulties and uncertainties of evaluating potential producing intervals.
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Needed: More Steel for Oil

Oil men must convince steel manufacturers to construct more facilities for producing oil country goods if growing demands are to be met adequately.

That's the gist of a paper presented this week by H. W. Ladd, chairman of the American Petroleum Institute's Committee on Standardization of Oilfield Equipment, at the API's annual convention in Chicago.

In the report, Ladd reviews recent growth in the steel industrys' facilities devoted largely to production of oil country goods, and says:

"It obviously took them [the steel makers] several years to be convinced that the position of the production division of the petroleum industry in this rapidly developing national economy and its relationship to the national defense was basic and sound; and that it would continue to play an important part in its progression, and thereby provide a dependable and ever-increasing demand for oil-country tubular goods for many years."

Ladd adds that "a more direct and concerted" effort by the oil industry to "sell" its demands to the steel industry would have brought faster results.

"We should think about the possibilities of maintaining closer relationships in the future," Ladd continues.

If present plans for expanding steel capacity for oil country goods are carried out, supply should meet most demands through 1960.

The steel companies are committed to a schedule of 15-million tons of new capacity in the next three years, Ladd notes. Thereafter, new capacity will increase at the rate of 3.5-million tons per year until 1965.

It is likely, however, that shortage conditions will continue through 1957, Ladd says, as the petroleum industry tries to restore the losses in drilling footage caused by last summer's steel strike.

Since there is no fixed capacity of oil-country goods production by mills, such capacity can only be estimated as a proportion of total capacity.

Using past experience as a principal supporting factor, Ladd estimates that this capacity will increase from 2.9-million tons this year to 4.2-million tons in 1960, and to 5.6-million tons in 1965.

But, he notes, tubular-goods mills collectively have not always received the steel needed to maintain maximum production. Strikes and other factors also cut into the total.

Shipments for domestic use, for example, will total only an estimated 2,250,000 tons this year, 3,780,000 tons in 1960, and 5,100,000 tons in 1965.

This compares with an estimated demand of 2,760,000 tons in 1956, 3,650,000 tons in 1960, and 5,091,000 tons in 1965.

Ladd says some of the deficits in supply will be made up through imports (about 65,000 tons in 1956), salvaged casing and tubing (200,000 tons this year), and uses of plain-end tubes for critically short oil well tubing.

A higher-than-expected increase in demand by the petroleum industry could result in new shortages if present steel expansion schedules are not revised upward at the same time.

Ladd notes that petroleum industry forecasts of future activity have consistently fallen short of actual accomplishments. If this happens again in the years immediately ahead, the petroleum industry again will find itself short of critically-needed steel goods.

That's why, Ladd says, the steel industry must be fully sold on the idea of being prepared to handle the swiftly growing needs of the petroleum industry.

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Turbo Won't Change Tools Now

The turbodrill is not expected to change materially the drilling equipment in use today, because its present use in this country will have to be interwoven with rotary tools.

But officials of Dresser Industries, Inc., which has 40 of the Russian turbodrills in the U.S., expect it eventually to replace the rotary.

Just when that time will arrive is a matter of considerable disagreement within the drilling and equipment industry. But right now, it is conceded that the rotary is probably more efficient for large-diameter surface holes, such as are necessary in spudding the deeper wells.

Then, too, the rotary presently is needed for certain types of fishing jobs, as well as for washover and milling operations where there is junk in the hole.

Theoretically, however, the turbodrills could change much of today's drilling equipment.

In fact, there are bound to be changes as the turbodrill meets with wide use in this country.

At present, the only use of the turbodrill is in an experimental hole on grounds adjacent to the Guiberson Corp. plant in South Dallas (PW—Nov.2'56,p13).

There, a 4,000 ft. hole is being drilled to train crews in the working of the turbodrill as well as to experiment with equipment.

These crews will be used by Dresser for educational purposes in the field, to train crews on rigs where the turbodrill is being employed for the first time.

A crew can be easily taught the fundamentals of operating the turbodrill, say Dresser officials.

A few things on which the turbodrill could have profound effect are:

• **Drilling mud.** It is desirable to keep the sand content in drilling mud as low as possible. This is not peculiar to the turbodrill, however; it applies to the rotary as well. A too-high sand content will accelerate the wear on either.

Still to be determined is how heavy the mud can be with the turbodrill. But it is already known that the lighter the better. In fact, the Russians have found water preferable.

• **Drillpipe.** The drillpipe, in general, will need to be of larger diameter for circulation on the turbodrill. The depth of the well and the size of the drill will determine this.

Because of the need for larger pipe, the use of tubing for drilling purposes is out. The drillpipe can be lighter, however, because the turbodrill does not subject the drillpipe to the dynamic stresses of the rotary. This will permit use of aluminum alloys.

• **Mud pumps.** The mud pumps will need to be larger because it is the mud that generates power that is applied to the turbodrill in the hole. This means that instead of a reduction in engine horsepower, there will be a need for more.

The basic horsepower on a rig is used for making trips. Its extent is determined primarily by the hoisting which a drilling contractor plans to do. In other words, how fast does a contractor desire to make trips in and out of the hole.

With the turbo, additional power for the mud pumps can be diverted from the rotary table, where very little is needed for the turbodrill. It is necessary to rotate the pipe slightly with the turbo, but this can be done by driving the rotary table intermittently or by letting it drift backward through the action of the turbo itself.

• **Bits.** Better bits are needed—a problem which now is being worked on. They are required in order to

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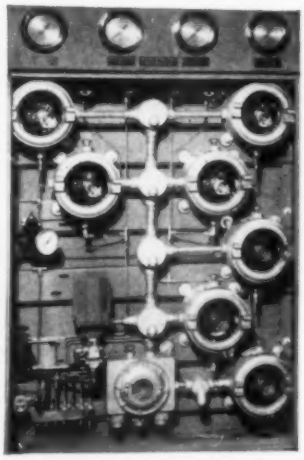

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lengthen the bit life and permit more time on the bottom of the hole.

The turbo shortens the life of the bit in hours, but not in hole-making. While the life may be only two hours, it is claimed that as much footage will be made in that short period as with a rotary in 24 hours. But if bit life could be lengthened, then the on-bottom time would be greater, and the penetration rate accelerated. Because of the short life of existing bits with the turbo, much time will be spent making trips in and out of the hole.

This would make automation in drilling worthwhile, particularly if some method could be devised for automatically picking up and laying down the drillpipe.

Diamonds may be the answer to longer bit life—if some way could be found so that the diamond bits could be rotated at the high speed of the turbo (600-700 rpm.).

The turbodrill comes in three types, with various sizes of each.

The types are the original or regular turbodrills, coring turbodrills, and sectional turbodrills.

The sectional drill is one that has two or three sections that can be connected in tandem to increase the torque on the bit.

While it generally has been accepted that the turbodrill comes in only two sizes, 5-in. and 10-in., there actually are intermediate sizes. These are 6⅜-in., 8-in., and 9-in. However, these sizes are not available in each of the three different types.

What's New / IN PRODUCTION

New Depth Record Set For Permian Basin

New depth record for the Permian Basin has been set at Gulf Oil Corp. No. 1 P. G. Northrup, Reeves County wildcat 24 mi. southeast of Pecos (PW—Sept.7'56,p20).

The test now is bottomed at 18,771 ft., where operator is seeking to regain lost circulation. The former record depth for the basin was 18,673 ft., reached in 1955 at Hunt Oil Co. et al No. 37 Elsinore Royalty Co., Pecos County. It was a dry hole.

The No. 1 Northrup is projected to 19,200 ft.

•

Unit Forms Available

Model forms for use in connection with the unitization of oil and gas fields now are available to the petroleum industry.

The general use of the forms for unit agreement and unit operating agreement will expedite agreements, H. F. Beardmore, of Warren Petroleum Corp., Houston, told this week's meeting of the American Petroleum Institute, in Chicago. He is chairman of the API subcommittee on unit agreements.

It is his opinion that the use of the model forms will simplify and shorten the negotiating period preliminary to the formation of a unit. Their use, he says, also will facilitate the handling by parties assigned to the processing of the agreement, which should reduce materially the time required to finalize the unit's organization. Oil and gas fields are unitized principally for conservation purposes.

•

Gulf Drops Proration

Gulf Oil Corp.'s court challenge of Oklahoma's "must buy" allowable order is still pending, despite Gulf's resumption of full allowables as of Nov. 1.

Gulf cut its buying to 75% of runs last July 1. The November allowable, however, is 20% under September.

The suit still pending in a U.S. District Court hinges on the question of whether the Oklahoma Corporation Commission order interferes with interstate commerce. Gulf had sought an injunction against the order rather than ask commission permission to reduce purchases (PW—Jul.13'56, p13).

•

The Utah Oil & Gas Conservation Commission has ruled that the Clear Creek natural gas field in Carbon County has reached economic development with the completion of 16 wells in the Ferron formation. This is the largest gas field found to date in Utah; it produces up to 70-million cu. ft. daily when demand warrants.

The decision was handed down as a result of an application of John Nicolaides, of Salt Lake City, to drill more wells on a 92-acre tract to pro-

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tect his property against gas drainage.

The regulatory body held that it does not have the authority to force compulsory unitization in areas exceeding 640 acres; that the 16 wells already completed will economically and efficiently drain the known extent of the field.

It further held that to establish drilling units would require the drilling of unnecessary wells in order to protect the correlative rights of each person owning an interest in the field.

Three States Natural Gas Co. is the operator in the field.

•

There has been a "marked increase" in interest in Alberta's oil sands because of the Suez situation, according to an official of the province.

Dr. K. A. Clarke, research engineer in charge of oil-sand studies for the province, reports that "new leases have been taken out constantly by oil companies during the last few months."

The sands are estimated to hold 300-billion bbl. of oil. Clarke emphasizes, however, that it will take years to bring oil from the sands in real volume.

•

Auction of leases on University of Texas land in West Texas will be held Nov. 27 at Austin.

Up for bidding will be 140 tracts in Andrews, Crane, Crockett, Pecos, Upton, and Ward Counties. Almost one-half of the tracts—66—are in Andrews.

•

A new wellhead that makes dual completion of a well both easy and quick, even though a single completion was planned, has been developed by Oil Center Tool Co.

The new head is adaptable to any completion practice, using either single or dual tubing strings. It also permits a last-minute change to a single completion if a proposed dual completion fails to materialize, and vice-versa.

•

Standard Oil Co. of California has drilled a shallow observation well to check on progress of its in situ combustion experiment near Maricopa, Calif. (PW—Jul.27'56,p14).

Standard drilled No. OV-5K, section 5-11n-23w, after the underground combustion phase of the thermal recovery experiment was begun.

Sand in which the experiment is being conducted occurs just below 2,000 ft. Company scientists anticipate that it might take as much as nine months to conclude the experiment.

•

Revenues from oil and gas rights in Alberta this year already have passed the previous full-year high, set in 1955.

Cumulative income to the provincial government totaled $101,149,633 for the first nine months of this year. An additional $14-million in cash bonuses paid by oil companies at the Oct. 10th Crown Reserve sale boosted revenues above the 1955 total of $108,956,114. Another Crown Reserve sale is scheduled for November.

•

Sales of natural gas by Texas producers increased 8.4% in August over the same month last year, the Texas Railroad Commission reports.

The total was more than 379-billion cu. ft. Pipelines took nearly 330-billion cu. ft. of the total. Shipments into other states totaled 326-billion cu. ft.

•

Oil well perforators that can be assembled to order at the well have been introduced by Lane Wells Co.

The new guns, radically different in appearance, consist of flat steel sections which bolt together to form shaped-charge carriers of practically any length required for the job. With a 50-ft. gun, as many as 200 shots are possible on one run.

•

Drilling Highlights

New Mexico—The deepest oil test ever drilled in this state—Phillips Petroleum Co. No. 6 Lea-Mex, section 23-17s-33e—has been completed as a discovery after going to 16,842 ft. in a pre-Cambrian formation. Production, however, is from the Pennsylvanian at 11,316-352 ft.—which means that this is not the deepest producing well in the state. The well produced 264 b/d of 37-gravity oil through 38-in. choke. Gas-oil ratio was 1,061-1. The strike is 25 mi. southwest of Lovington and 2 mi. east of the shallow Maljamar pool.

North Dakota—North Central Oil Corp. is setting pipe to test production on a probable discovery, section 36-163n-83w, in Bottineau County. No. 1, Arthur Pearson, if completed as a producer, would be the first in the state since June. The test is 13 mi. southwest of nearest production.

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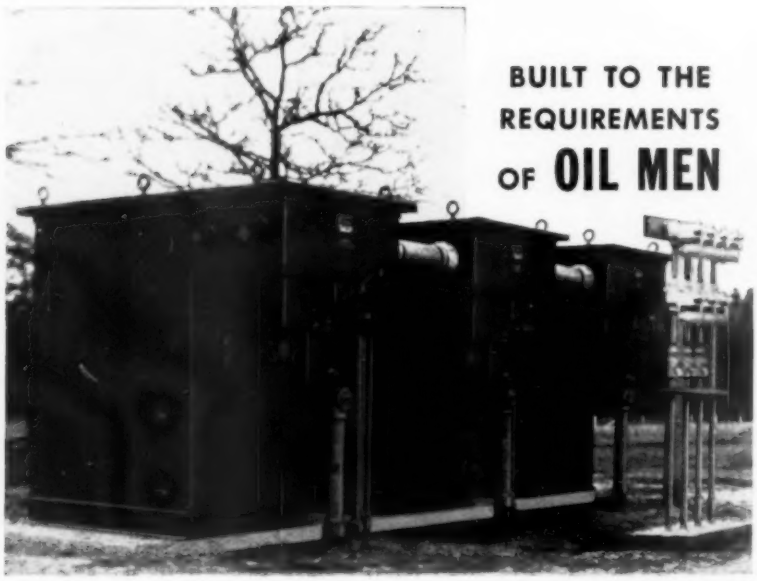

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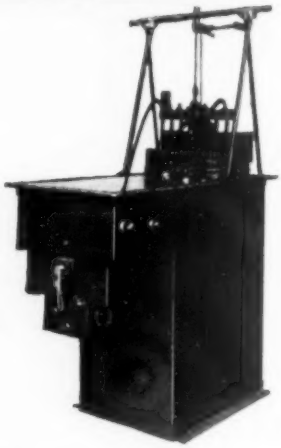

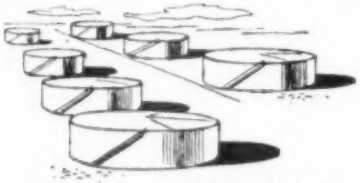

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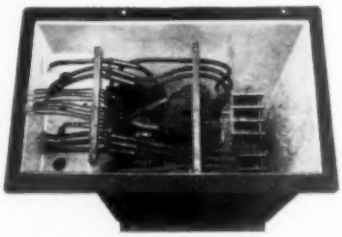
Write for Bulletin 1062-20.

Contactor and Relay Panel are bolted together for raising as a unit above the oil. No leads or bolts to disconnect. Shown is Cat. No. 2645A Lifting Mechanism, available at small cost.



Looking down into starter showing anti-syphon lead construction from contactor, control transformer and overload relay panel to conduit connection box with threaded couplings. Starter with all disconnect switch shown in views above.

5626

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EC&M DIVISION · CLEVELAND 28 OHIO

in the Kuroki field. Drillstem test recovered 210 ft. of oil and 70 ft. of oil-cut mud in the Mission Canyon (Mississippian) from 4,012-22 ft.

Nevada—Shell Oil Co. has abandoned its Diamond Valley wildcat, in Elko County, at 8,042 ft., leaving the state without any major operators sinking tests. No shows were encountered in the Shell project.

Montana—Best well to date in the Northeast Bredette field in Daniels County is Carter Oil Co. No. 1 Tong, section 34-33n-49w, north of the discovery. It was completed for 720 b/d from the MacGowan zone of the Mississippian below 7,730 ft.

Oklahoma—New gas-distillate pay has been indicated from the Cisco (Pennsylvanian) in the one-well Burns pool of Grady County. A. A. Cameron's No. 1 Fedler Unit, section 31-3n-8w, gauged 8½-million cu. ft. of gas daily with a spray of distillate on drillstem test at 6,726-57 feet. Recovery was 270 ft. of distillate. The discovery was completed at 7,200 ft.

West Texas—Superior Oil Co. No. 1-A Walton, section 21, block B-3, psl survey, has been completed as an Ellenburger discovery 4 mi. northeast of Kermit, in Winkler County. Potential was 243 b/d of 43.1-gravity oil through 19/64-in. choke from perforations at 10,632-50 ft.

Utah—Carter Oil Co. has discovered oil in the Mississippian at No. 2 Navajo Gothic, section 36-40s-21e, San Juan County. The wildcat, first Mississippian find in this sector of the Paradox Basin, is producing from 6,705-82 ft. Carter also has scheduled an important test of the Paradox (Pennsylvanian) about 9 mi. east of the East Aneth pool, also in San Juan County. This is the area where many Navajo tribal leases were sold to companies last week (PW—Nov.9'56,p19).

Louisiana—Drilling & Exploration Co. and Olin Oil & Gas Corp. have combined to give St. Landry Parish a new discovery at No. 1 Jacob Higginbotham Unit, section 28-6s-3e. The well rated 2-million cu. ft. of gas and 17.2 bbl. of distillate per day through 12/64 in. choke from perforations at 9,380-84 ft.

Kansas—Lion Oil Co. has racked up a gas discovery in Meade County, only ¼ mi. north of the Oklahoma state line. No. 1 Marion, section 14-35s-27w, rated 4,890,000 cu. ft. of gas daily through 30/64-in. choke from perforations at 6,275-307 ft.

Magnolia Co. Installing Oil Industry's First Offshore Microwave Radio Communications

To coordinate production and pipe line operations in the Gulf of Mexico off Morgan City, La., a five-station, four-hop RCA Microwave Radio System, now under construction by Magnolia Petroleum Co., Dallas, will span a distance of more than 75 miles and provide approximately 55 miles of over-water communications.

Dependable RCA Microwave Radio was selected as the communications medium because of crowded VHF radio conditions in the area; also to provide facilities for additional services, such as telemetering and equipment control.

The system will be extended from Morgan City to Burns Terminal, 19 miles away, then 24 miles out into the Gulf of Mexico to Magnolia's Block 51 oil field. From Block 51 the system will extend 23 miles to Block 126 and on to Block 128, nine miles away. RCA CW-20 equipment, operating in the 2000 mc band will be used, with a capacity of 30 channels.

RCA Microwave Specialists will be glad to answer any questions and help plan your installation. Mail coupon for further particulars on use of RCA Microwave Radio in utilities, pipe lines, turnpikes and other applications.

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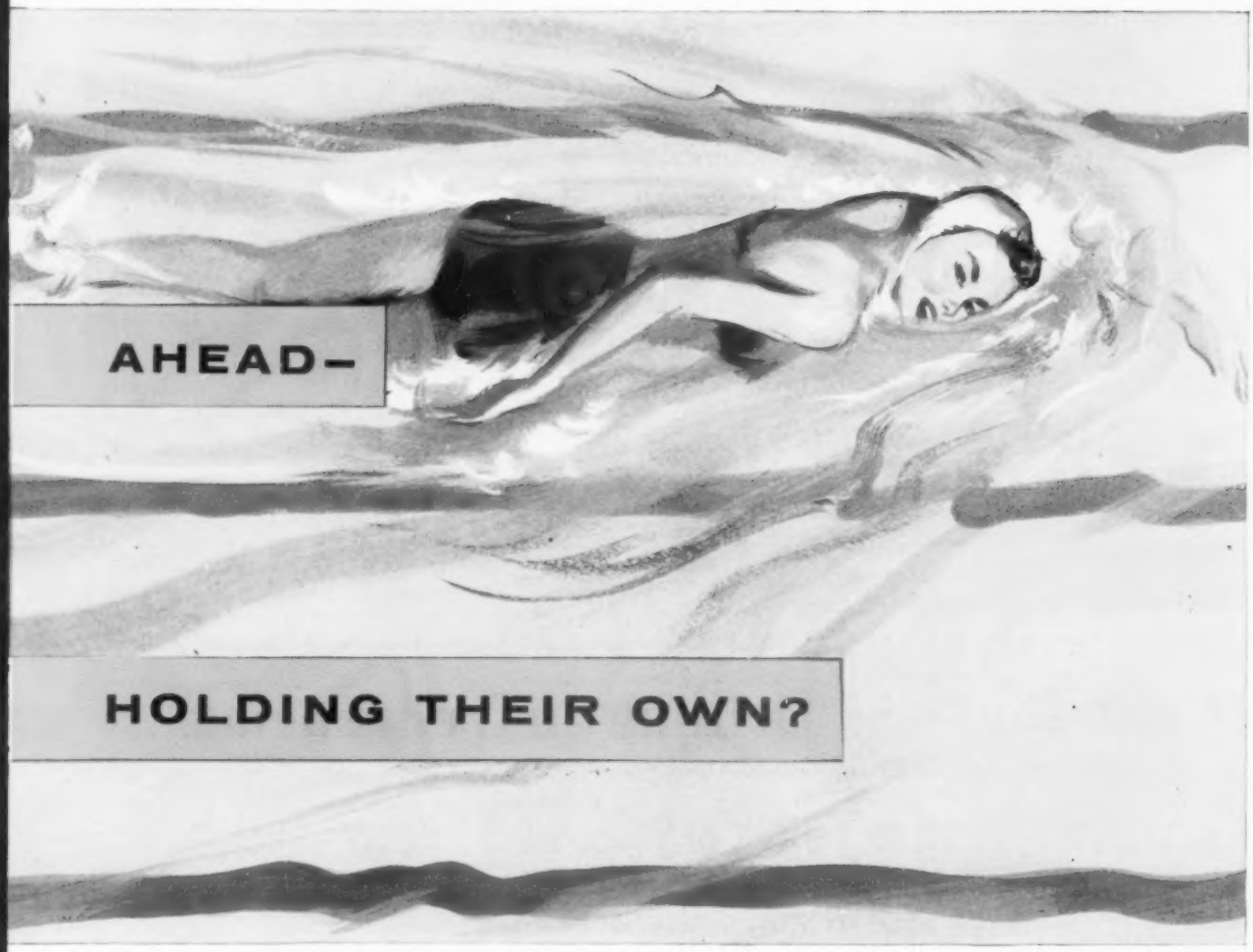

In the race for higher octanes, you cannot afford to forget that the goal is to improve the general quality of your pool gasolines. PENEX offers a means of accomplishing this practically and economically. It should be given immediate consideration in your planning.

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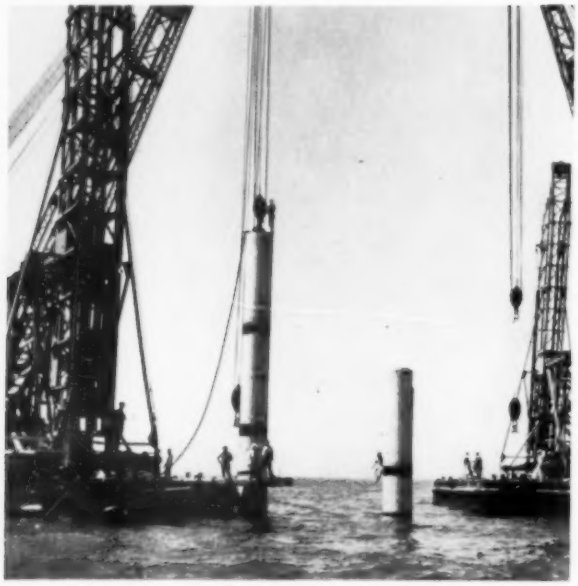

MORE OFFSHORE PLATFORMS will go up soon on new Lake Maracaibo acreage as oil firms . . .

Gear for New Drilling in Venezuela

A Report from PETROLEUM WEEK's Caracas Correspondent

CARACAS—The tough, costly job of putting a bit down through 100 ft. or more of brackish water is spotlighted now on Lake Maracaibo, following U.S. oil companies' recent concession-buying splurge in Venezuela.

Newcomers to the scene are fitting platform construction, pipe and barge deliveries, and drilling schedules into a pattern which will start rigs working in early 1957 on more than 309,000 acres of underwater oil leases (PW—Aug.24'56,p24).

That is the acreage that accounted for most of the $408-million in bonus bids by 14 companies in the first round of concession letting, at prices ranging up to $2,750 an acre.

New tracts on the fringes of the great Tia Juana and Bachaquero fields are believed to hold plenty of oil. But it will cost an estimated average of $400,000 per well to prove it.

I. Plans Are Laid

Newcomers to the scene are losing no time in laying plans to start drilling as soon as possible.

• Superior Oil Co., which paid $2,551 per acre for its 7,773-acre Group 75 tract in the middle of the lake, will be among the first. It expects to spud in a well in February.

• Sun Oil Co., operator for a combine including Atlantic Refining and Seaboard, will get into action about the same time on the group's 24,700-acre Block 1, also in the middle of the lake.

• Sun and Atlantic also are laying plans to start drilling in the first half of the year on the 2,077-acre Central V-574 tract, near the eastern shore. The two companies, on a 50-50 basis, have acquired drilling rights to this tract from Venezuelan American Independent Oil Producers Assn.

• Signal Exploration Co., operator for the Signal-Hancock-Pure-Sohio group, has a drilling barge on order in New Orleans. It expects to spud in its first well around Apr. 1 in its 27,602-acre Block 4.

• San Jacinto Petroleum Corp. is acquiring equipment to develop the Northwest V-575 Venezuelan Leaseholds concession. This 1,969-acre tract was sold to a five-company group including San Jacinto, Tennessee Gas Transmission Co., Union Oil & Gas Corp. of Louisiana, Lion Oil Co., and Murphy Corp. (PW—Sep.28'56,p30). Venezuelan Leaseholds will retain half the profits from the operation.

The established companies in Venezuela also are gearing for an early start on their new lake concessions. Mene Grande (Gulf) and Shell are expected to start work in the opening months of 1957.

So will Creole, which built most of the 1,500 platforms now on the lake. Creole has announced that it will acquire several movable platforms, presumably of the type used for offshore drilling in the Gulf of Mexico.

Schedules call for around 60 days to set up drilling platforms in the lake, and an average of 80 to 90 days for actual drilling.

Creole maintains its own casting yard at La Salinas for mass-producing poured concrete pilings for platforms.

Other companies will build platforms using a type of steel-encased, "post-stressed" concrete piling made in sections by Raymond Concrete Pile Co., at Bachaquero, on the lake shore.

II. New Problems Ahead

Having risked big money on their Maracaibo acreage, newcomers are now wrestling with the myriads of unfamiliar problems involved in an overwater operation. Not the least of these is personnel.

"For companies new on the lake," one oil man says, "the concessions are a drain on personnel. Half a dozen key men are the heart out of any or-

ganization, and the best are none too good for this job. There are thousands of details requiring experience that only Creole and Shell have at present."

Other important problems are water transport—which accounts for up to 20% of costs on some operations—and safety. Weather, too, is a factor, even on Maracaibo's inland waters.

III. Lake Prospects Vary

Prospects for the new Maracaibo leases are calculated on the basis of a general offshore dip and southwest trend from present production.

Creole is currently taking more than 900,000 b/d out of the lake, and Shell better than 150,000 b/d. Production is from the Miocene near the eastern shore, and from the Eocene toward midlake.

Superior's Group 75 is wrapped around a corner of Shell's Lagomar concession, and is only 1½ mi. from the nearest of 90 producing wells.

Northern lease lines of Blocks 1 to 4 are 4 to 6 mi. from closest Shell and Creole producers. These blocks are held by Sun-Atlantic-Seaboard (1), Mene Grande (2 and 3), and the Signal group (4).

Creole's new Block 5, farther south, is still a likely prospect. But faults in the midlake formations make the outlook somewhat less certain for Mene Grande's Block 6, Shell's Blocks 7 and 8, Star Oil's 9, and Venezuelan American Independent's 10.

In the cluster of five new national-reserve leases off the eastern shore, Shell's 10,000-acre Northwest V-574 is 2 mi. from Creole's nearest producer in the Bachaquero field. There's no dry hole in between. Shell paid $2,750 per acre for the lot.

Mene Grande, which took two of the reserves, spudded in a well on a previous V-575 concession last April. One report says No. 1 Ceuta encountered a 250-ft. pay zone. The well, about 8 mi. offshore, was Mene Grande's first outside its old 1-km. shoreline strip.

IV. Onshore Plans Wait

Star Oil's $41-million, 21,000-acre Mara concession, northwest of Maracaibo, is the only dry-land exploitation lease granted to date—and among the costliest. Geologists believe the Mara field extends into the northwest corner of the concession. Plans for the acreage are not yet fixed.

Exploration leases have been granted on 668,000 acres along the Colombian border, and eventually most of Venezuela's western boundary will be covered.

Companies are taking the border concessions sight unseen, at the minimum of $19.65 an acre, as part of the bargain for the development acreage. They're in no hurry to look at the frontier tracts.

V. New Offers Are Pending

Oil men here, meanwhile, are awaiting word of the next concession offering. The government gives no hint of its intentions, but it is said to be ready with blocked-out maps of areas in the southwestern states of Barinas, in the eastern states of Monagas, and in the Gulf of Paria, facing Trinidad.

The mapping procedure was used in Lake Maracaibo to eliminate overlapping bids. Once the blocks are laid out and bonus minimums set, interested companies will be called in to the Ministry of Mines & Hydrocarbons and invited to submit new bids on them.

Bonus minimums for new Barinas acreage will reportedly range upwards from $65.50 per acre, which oil men consider too high for most of the acreage. One reason for the delay in the expected offerings may be that the government is reconsidering these minimums.

Sinclair and Socony have three shut-in fields in Barinas that await construction of their pipeline. Sinclair has 15 producing wells capped in its Sinco field, and Socony has around a dozen in its Silvestre and Silvan fields. The liveliest bidding for new leases is expected along the northward trend from those areas.

Speculation is growing that there may be no further offerings until next year. One reason is that the bonus take so far already fulfills one government objective of immediate revenue to help pay for its big public works program.

This was one of the primary reasons for the government's first new concession awards in a decade.

Another objective of a substantial expansion of market outlets has also been largely achieved.

This objective was first formulated against the background of the U.S. fight over oil imports, as Venezuelan crude output was rising steadily to the 2½-million b/d mark. Now the subject appears in a new light, as the eruption of violence in the Middle East promises to increase European demand for both U.S. and Venezuelan oil, at least in the immediate future.

The 14 companies operating in Venezuela earlier this year have now been increased by 15 more, which share in ownership or operation of new concessions.

At least another ten companies incorporated in Venezuela are awaiting a chance at new offerings. These include German, French, and Spanish groups, as well as U.S. firms.

Earlier it looked as if European companies might come in strong, encouraged by the government as a means of broadening Venezuela's international market outlets.

European bidders may be heard from yet, particularly now that the Middle East crisis highlights potentially greater demand for Venezuelan oil from Europe.

So far, there has been a notable absence of serious European competition for the available concessions, with the sole exception of Shell.

Cia. Iberica de Petroleos, a Spanish firm which bid unsuccessfully for Maracaibo Block 9, is expected to try again. French and German groups, too, are still awaiting their chances.

VI. Payments Now Due

By early January, Venezuela's treasury will be bulging with the concession payments now coming in.

Cash is due within a month after oil companies' survey maps of their new concessions are submitted and approved.

So far, all bidders, with a single exception, have been given two months to prepare the maps. Star Oil got eight months to draw up maps of its Mara field tract.

VII. Costs Are Rising

New operators are entering Venezuela at a time when costs of producing oil are rising, with larger capital investments and higher operating expenditures in view.

The oil industry's annual rate of reinvestment of earnings fell from a peak of 72% in 1948 to around 16% last year. It's due for another upswing now, since both the oil industry and the country's economy as a whole have achieved greater maturity.

Some new elements what will contribute to this:

- Refinery expansion is in full swing, and the government has raised domestic refining requirements for new concession holders.
- Labor costs have just been hiked an estimated 17% in new wages and benefits, to an average of about $24 per worker-day (PW—Nov.2'56, p24).
- Gas conservation is being pushed in connection with the national petrochemical program. Some

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OIL FOR TO-DAY AND TO-MORROW

BEARING FRUIT

Saudis Cut Oil Supply

BEIRUT—The Saudi Arabian government's ban on shipments of Saudi oil to Britain and France has cut another 300,000 b/d from the dwindling supply of Middle East oil available to them.

Sabotage of Iraq Petroleum Co.'s pipelines to the Mediterranean has already eliminated the flow of 540,000 b/d from the Kirkuk fields in Iraq (PW—Nov.9'56,p9).

An Arabian American Oil Co. spokesman here confirmed that the ban had been imposed the week before, when the Saudi government severed diplomatic relations with Britain, and is now in full effect.

No British or French tankers have called at the Saudi port of Ras Tanura in the Persian Gulf, nor at Taplines' Sidon terminal in Lebanon, since the ban went into effect, he said.

Aramco and Tapline have complied with the ban on loading of British and French tankers, as well as tankers of other flags that are bound for Britain and France, the spokesman said.

This knocks out about 125,000 b/d of both products and crude normally lifted from Ras Tanura and Sidon for Britain and France. Most of this total is products.

At the same time, the Saudi government has cut off the supply of Saudi Arabian crude to the British-protected sheikhdom of Bahrain in the Persian Gulf, eliminating another 175,000 b/d to 200,000 b/d.

Up to this point, that amount of crude from Saudi Arabia has been piped to the Bahrain Petroleum Co. (Caltex) refinery for processing. Bapco said it would continue to operate the plant below its 210,000 b/d capacity, using reserve stocks and its own 30,000 b/d Bahrain crude output.

Meanwhile, an Iraq Petroleum Co. spokesman in Beirut says there is still no oil flowing from the Kirkuk fields to the Mediterranean terminals. The flow was stopped by extensive sabotage of three pumping stations in Syria and of the pipeline itself near Tripoli.

The stoppage also backfires on the pipeline transit countries themselves. The Syrian and Jordanian armies depend largely on IPC's Tripoli refinery for their fuel supply.

Syria and Jordan have already banned private car traffic due to a gasoline shortage. Lebanon has declared that most oil stocks in Tripoli are sufficient for one year, but a kerosine shortage is already felt.

Syria, meanwhile, has not replied to British charges that the IPC pumping stations were blown up by Syrian army units and demands that the Syrian government take charge of repairs.

The extent of damage is considerable. Estimates on the length of time it would take for repairs vary widely from two months to a year.

Socony Sells Out in Israel

Socony Mobil Oil Co. has sold out its business in Israel effective Dec. 31, because of the difficulties of doing business in Israel and Arab countries simultaneously.

Sonneborn interests of New York have purchased the business of Mobil Oil Israel, Ltd., the Socony affiliate, according to a joint announcement last week.

Negotiations for the transaction had been under way for many months.

A Socony spokesman declined to say whether Arab states had forced the company to withdraw from Israel.

The only explanation it gave, in answer to questions, was the "long-continued and increasing difficulties of doing business in Israel and in the Arab countries."

Socony has a share in the crude oil production of both Saudi Arabia and Iraq—10% and 12%, respectively.

Socony has been a marketer in the Palestine area (now Israel) since before World War I. It has no oil production there.

The company has been the third largest marketer in Israel, following the Government-owned marketing company and Shell.

The volume of its business amounted to a little under one-quarter of the total business in Israel. Israel's oil consumption is currently running around 20,000 b/d, with the Socony share apparently about 5,000 b/d.

The company had a processing agreement at the Haifa refinery for crude oil it imported.

It also imported some products, notably lubricating oils.

The Sonneborn interests will continue the business of marketing "a full line of petroleum products through a company which will have an ade-

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quate supply of crude oil and transportation," according to the announcement.

It intends to retain all present employees.

No details were given as to where Sonneborn will get its crude. Presumably, it will come from Western Hemisphere sources, though there has been no official information released on this.

The Sonneborn interests have been in the oil business for more than half a century. Their operations include marketing and refining, as well as petroleum chemicals.

What's New / AROUND THE WORLD

FRANCE—Esso S.A.F. will start construction shortly on its projected new refinery in the Bordeaux area of southwest France. It will also complete a 21,000 b/d catalytic cracking unit at its Port Jerome refinery in the first quarter of 1957.

The new plant will go into operation by 1959 at Bec d'Ambes, with initial capacity of 30,000 b/d (PW—Mar.2'56,p30). It will include a distillation unit and a catalytic reformer for production of high-octane gasoline.

The plant will process the fast-growing output of Esso's Parentis field, which reached an average of 22,810 b/d in October. Esso's total Bordeaux production in the first ten months of this year jumped 80% over the same period of 1955, to an average of 18,910 b/d. The crude at present is shipped to the Port Jerome refinery, near Le Havre.

In the future, Esso also expects to add a catalytic reformer to the Port Jerome plant.

Middle East crude accounts for about 63% of the throughput at the 75,000 b/d Port Jerome plant. Another 17% comes from Venezuela, and about 5% from the U.S.

•

INDIA—A "large number" of U.S. and Canadian companies have offered to explore for oil in India, either under government contract, or "otherwise," according to Minister of Natural Resources K. D. Malaviya (PW—Nov.9'56,p32).

The official also said that the French affiliate of Schlumberger Well Surveying Corp. will be commissioned by the goverment to conduct seismic and gravimetric surveys of oil-bearing tracts in Rajasthan in northwestern India.

•

GUATEMALA—Six more Peten oil concessions were earmarked for award last week. They'll go to:

Sun Petroleum, 261,057 acres; Petroleos Guatemaltecos, 592,896 acres; Amerada Petroleum, 584,607 acres (to be shared equally with Ohio Oil and Continental); Esso, 61,494 acres; Union Oil, 32,573 acres; Standard of California, 160,006 acres.

•

PERU—The government plans to open up Peru's continental shelf for oil exploration.

Starting at the end of December, bids from Peruvian interests will be accepted for 60 days. At the end of that time, foreign companies may submit bids for 30 days.

One applicant may bid on a maximum of 248,550 acres offshore.

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NEWS

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November ★ One of a Series of Bulletins for the Petroleum Industry ★ 1956

Du Pont uses sports car to study fuel-injection related to product development

Although sports cars are designed for road racing or as a highway hobby, the Du Pont Petroleum Laboratory is now using one for an entirely different purpose.

With an eye to future automotive fuel requirements, the laboratory is now fitting out a new Mercedes-Benz, 300 SL, with special instrumentation. The objective is to investigate the additive needs of fuels for fuel-injection engines and to test promising candidates under actual road conditions. The Mercedes-Benz was picked for this work because it is the only car with a fuel-injection engine that is commercially available in this country.

Mercaptide problems solved with DMD

If you are not now using Du Pont Metal Deactivator in your heating and diesel fuels, we believe you will be interested in the success of other refiners who have used it.

Several years ago, for example, a major oil company was having copper mercaptide problems. They encountered the trouble in both straight-run diesel fuel and No. 2 fuel oil composed of 95% straight-run and 5% Houdry cat-cracked.

To solve the problem, 2 pounds of DMD per 1,000 barrels were added to both fuels. This proved highly successful for several seasons. Then the use of DMD was discontinued. The trouble recurred. So DMD was again added, and this company's mercaptide problem was again under control.

Another major company encountered gel-clogging complaints in the Spring of 1955. The trouble involved a No. 2 fuel oil composed of fluid cat-cracked and straight-run. The cracked component varied in composition from 75% to 90%.

During the next heating season, the company added 2 pounds of DMD (in combination with Du Pont Fuel Oil Additive No. 2) per 1,000 barrels. There were no complaints of mercaptide formation reported the following season.

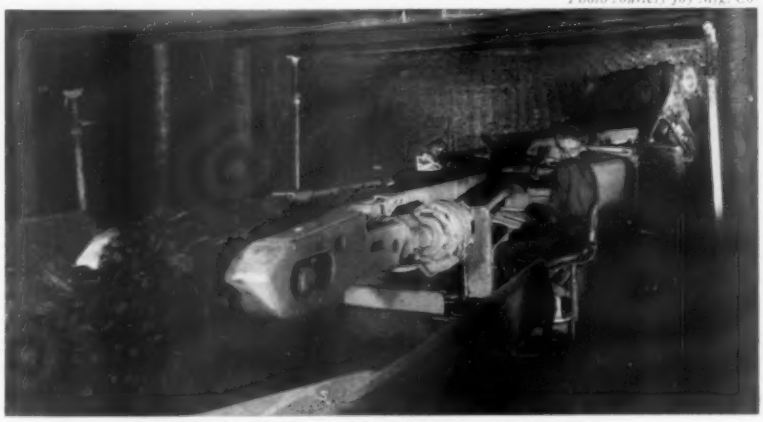
These are only two of the many success stories reported by refiners using DMD to combat mercaptide problems and complaints. And many refiners have found that since the cost of adding effective amounts of DMD is so low, it pays to use it as an "insurance" against copper contamination in a wide variety of products.

Greases containing Du Pont Estersil GT prove highly successful in many types of service

It was about two years ago that Du Pont estersil grease thickener was first introduced.

Since then, millions of pounds of grease made with this unique thickening agent have been used in a wide variety of industrial and automotive applications. And the success obtained with these greases has been truly outstanding.

Photo courtesy Joy Mfg. Co.



CONTINUOUS MINER—completely lubricated with estersil grease

One coal mining company, for example, reports that they eliminated the need for using three different mining equipment lubricants by standardizing on semi-fluid estersil-based grease in their continuous miners, loading machines and shuttle cars.

In the gear cases of the continuous miners, this company, before using an estersil grease, had a lubricant consumption of two to three *gallons* per shift. When they changed to an estersil grease, they found that the average consumption immediately dropped 75% to two to three *quarts* per shift. On loaders they actually stopped keeping records because the consumption was so small.

Longer gear life

When rebuilding machines, this same company had almost always replaced bearings and gears. But since switching to the estersil grease, they found that the gears could be used over and over again without significant wear. This was probably due – at least partially—to the fact that the estersil grease effectively sealed out moisture, dirt, coal dust and other abrasive foreign matter.

Maintenance costs down

Another user in the coal industry re-

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CONTINUED *Estersil GT*

ports that the use of an estersil-based grease has caused his maintenance costs on a group of cutting machines to drop from .185 cents per ton to less than .09 cents per ton—a 50% saving.

Many users report that equipment runs much cooler and quieter with estersil-based greases.

In addition to heavy-duty industrial applications, estersil greases have been used in several automotive applications. In passenger cars, test engineers

THIS DEMONSTRATION dramatizes the unusual water resistance of estersil greases. They can be immersed in boiling water for long periods without breakdown.

report, these greases greatly prolong the smoother, easy-riding effect of a fresh lube job.

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Continued middle next column

ASSISTANT TO THE SALES MANAGER—ADDITIVES

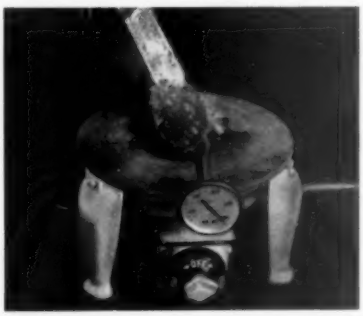
RICHARD O. BRAENDLE joined the Du Pont Company in 1944 after receiving his B.S. degree in Chemical Engineering at Massachusetts Institute of Technology.

He was first assigned to the Grasselli Chemicals Department's Experimental Laboratory in Cleveland. There he did development research on inorganic chemicals, mainly estersils. In 1950, he was transferred to the Du Pont Experimental Station in Wilmington where he worked on the application of estersils as grease thickeners.

He joined the Technical Section of the Petroleum Chemicals Division in 1952, continuing his product development work on estersil GT. During 1955 he did market research analysis for a number of petroleum additives which led to his current assignment as assistant to the sales manager for additives.

During World War II, Mr. Braendle served in the U. S. Army as a researcher and supervisor of a manufacturing operation on the Manhattan Project. He is a member of the American Chemical Society and the American Society of Lubrication Engineers.

RICHARD O. BRAENDLE



ESTERSIL GT greases stand up unusually well even under the combined action of intense heat and vigorous mechanical working.

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Estersil greases are non-melting, and extremely wide temperature ranges produce little change in their consistency.

Even under prolonged high-shear, high-temperature operating conditions, greases made with Du Pont Estersil GT show outstanding resistance to mechanical breakdown.

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DEPT/Research

Weather Problems Will Remain

- **Research in long-range forecasting is developing new methods for more accurate predictions.**
- **But it will be years before the studies will aid oil men in their fight against "unpredictable" Jupe Pluvius.**

Oil men responsible for long-term operational planning got some good news this week. They've just been told that great strides in long-range weather forecasting are on the way. But they're still at least five or ten years—or more—away.

Oil men got this report from five weather forecasting experts Monday at a special session of the American Petroleum Institute's 36th annual meeting, in Chicago.

The session was sponsored by API's Advisory Committee on Fundamental Research on Weather Forecasting. This committee was set up in late 1954 "to help find ways for taking the crystal ball aspects out of weather forecasting, putting it on a footing of reliability and security."

Preliminary data gathered by the committee indicate that short-range forecasts, up to about seven days, are "fairly accurate." Now it is working to ferret out a procedure to give reliable predictions up to nine months ahead.

More accurate long-range forecasts—when they come—will be welcomed by every segment of the industry.

PRODUCERS will be able to plan drilling and construction projects in accordance with future weather tables.

Offshore operators will be especially affected. Rig crews will be able to gird for bad weather. And operators will be able to avoid fog, heavy seas, or hurricanes in moving rigs or rig supplies.

REFINERS might tie runs of gasoline and heating oils to such forecasts.

With a reliable long-range forecast, refiners could minimize storage problems, and, more important, eliminate the possibility of overproduction or underproduction.

TRANSPORTERS will be able to make, and meet better shipping schedules.

And, having a foreknowledge of what the weather will be like in various parts of the country, transporters will be able to use their equipment to the fullest extent. For instance, they could move their stock to potential "short" areas, where weather reports indicated an unusually heavy demand was due.

MIT's HURD C. WILLETT: "Forecasting on a monthly and seasonal basis will be practical only in terms of mean conditions and trends, not at all on a detailed day-to-day basis."

MARKETERS could minimize storage and sales problems. If accurate weather information becomes available well in advance, marketers will be able to estimate consumption in advance. So the flow of products from refinery to bulk plant to consumer will be smoother and steadier.

Here's what the forecasters told oil men about the future of long-range weather predictions:

All approaches to improving long-range weather forecasting still need a great deal of development.

No one can say for sure how long such development will take. For one thing, there's a question of funds for this research—without adequate financial support the work could drag on interminably. (API's "weather" committee can only help support a few studies which give promise of significant application to oil problems.)

Besides, although many of the factors which cause weather variations are known, meteorologists lack considerable knowledge concerning the precise relationships between these factors and their effects.

Nevertheless, the experts give these estimates of probable progress:

• Statistical weather-pattern studies may double the present accuracy of long-range forecasts, raising it to 40% of perfect—but not for at least five years.

Hurd C. Willett, professor of meteorology at Massachusetts Institute of Technology, told the API meeting that statistics on past weather patterns can be used to determine future weather.

Willett says that this technique, already in use, will be more valuable in the future when high-speed computers become available for the vast amount of computational work, selective application, and testing (see automation story, page 71).

• Research on internal "mechanics" of general weather circulation may raise the accuracy of long-range forecasts to 60% of perfect in ten years.

Willett points out that this type of long-range forecasting research—called "physical-synoptic" research—is only getting started.

"The physical-synoptic approach," says Willett, "will require a longer time than the purely statistical approach for full development to maximum effectiveness, because it depends on concepts which only now are being formed. Before being perfected for practical application to long-range forecasting, these concepts will require further analysis of worldwide weather observations."

• Investigations of solar influence on weather may bring long-range forecast accuracy up to 70% by 1976.

Sunspots and other irregular solar activity have been found to have a direct bearing on both long-term and short-term variations in world weather. But researchers have a long way to go to determine the exact influence solar disturbances have on the earth's weather.

Even with these developments, long-range forecasting will probably be accurate only for predicting general weather trends. Forecasters don't expect that the long-range weather prophesies of tomorrow will be able to analyze day-to-day fluctuations with much success.

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More on the Cost-Price Squeeze

Producers and drilling contractors aren't the only ones hit by inflation. Tank truck carriers, retailers, and jobbers are also feeling the impact of higher costs. So are refiners, though perhaps not so severely. Pipelines are probably being hurt less than other branches of the industry.

All sectors of the oil industry are absorbing a good part of these higher costs. For the most part, the industry is just too competitive simply to pass them on. And the prospects are that this situation is bound to continue at least into 1957.

Last month, this column pointed out some of the over-all effects of inflation on the oil industry (PW—Oct.19'56,p27). Here's a more detailed rundown on how inflation is hitting some of the industry's major sectors:

* * * *

Producers and drilling contractors face rising costs of oil equipment, labor, and so on—and have had to absorb most, if not all, of them (PW—Oct.5'56,p20).

Furthermore, the present tight money situation is hurting them. They use a lot of borrowed money, and now they have to pay more for it. Tight money, generally thought of as deflationary, is inflationary as far as they are concerned. It's inflating their costs, and may well cut into their drilling.

Yet the price of what the producers sell—crude—has risen less than 1% in the past two years. And unless the importation of foreign oil is restrained, it's not likely to go much higher.

To meet the problem, they are cutting corners, abandoning uneconomic wells to salvage pipe, constantly trying to improve equipment—and doing lots of things they wouldn't do if the market were in better shape.

* * * *

Refiners also feel in some degree the cost-price squeeze. Wages are up, and so are prices for materials.

Most refiners are faced with the problem of building new plant and buying new equipment to meet the demand for higher product quality and to be able to use lower-grade crudes. And money for new plant and equipment costs more (PW—Sep.21'56,p15).

Meanwhile, the prices of refinery products just haven't kept up with these rising costs—though they have made a better showing than crude oil prices. Oversupply of product—especially gasoline—holds them down. In fact, oversupply has actually pushed gasoline prices lower in recent weeks.

Nevertheless, most refiners are not hurting too badly. There's no question that they've felt the increases in wage costs and material prices. But on the other hand, the cost of domestic crude has not risen much. Many of them have been able to increase their use of cheaper, foreign crudes and lower-grade domestic crudes. And they are often able to increase a price here or a price there, such as the recent distillates rise (PW—Oct.19'56,p27).

* * * *

Jobbers' costs are rising, while for the last two or three years their margins have remained almost constant—in spite of a struggle to raise them. They have had some success, as when Phillips recently adopted a sliding scale for margins similar to the one proposed by the National Oil Jobbers Council. But jobbers' efforts for higher margins are far from being universally fruitful.

Gasoline dealers are in a squeeze. Their costs—wages, interest, supplies, and the like—have risen. But in the past two years, average gasoline prices at retail, ex. tax, in 54 selected cities have scarcely moved—up less than 1%.

* * * *

Tank-truck operators say they can't meet their increased costs by raising prices, because, except in isolated cases, they face rail and pipe competitors that just haven't upped their rates. The operators claim the cost-price squeeze is really hurting them.

Pipelines seem to be in not too bad shape. Thanks to automation and modernization programs already carried out, labor costs are but a small part of their total costs. Of course, any new installation of pipe or equipment is going to be costly. Steel and machinery prices have risen sharply. But existing pipelines actually benefit by inflation—thanks to past construction and slow obsolescence.

* * * *

All in all, the integrated company is in the best shape—because it is able to ease the squeeze by shifting costs from one level to another, while the company that's in just one segment of the industry is boxed in by competition within that segment. But even the integrated companies will feel the pinch as long as labor costs and industrial prices continue to outpace the prices of what they sell.

* * * *

The outlook for 1957 isn't all bad. Higher retail prices are being posted on kerosine and distillates. Gasoline prices haven't dropped as much as might have been expected in view of heavy inventories. And at least one leader in the industry, Herbert Willets, of Socony Mobil Oil Co., has already made the reassuring prediction of a "somewhat higher price level in the oil industry for next year" (PW—Oct.12'56, p39).

What do they look for

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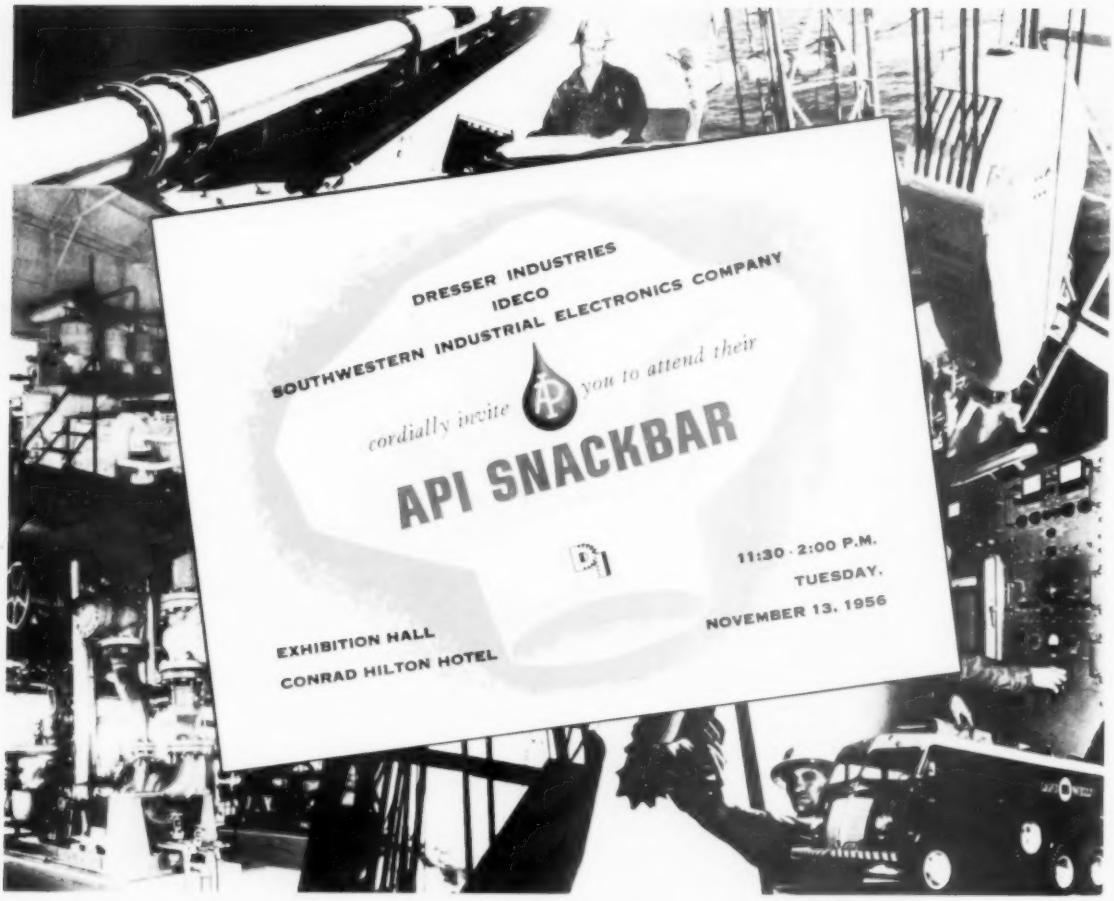

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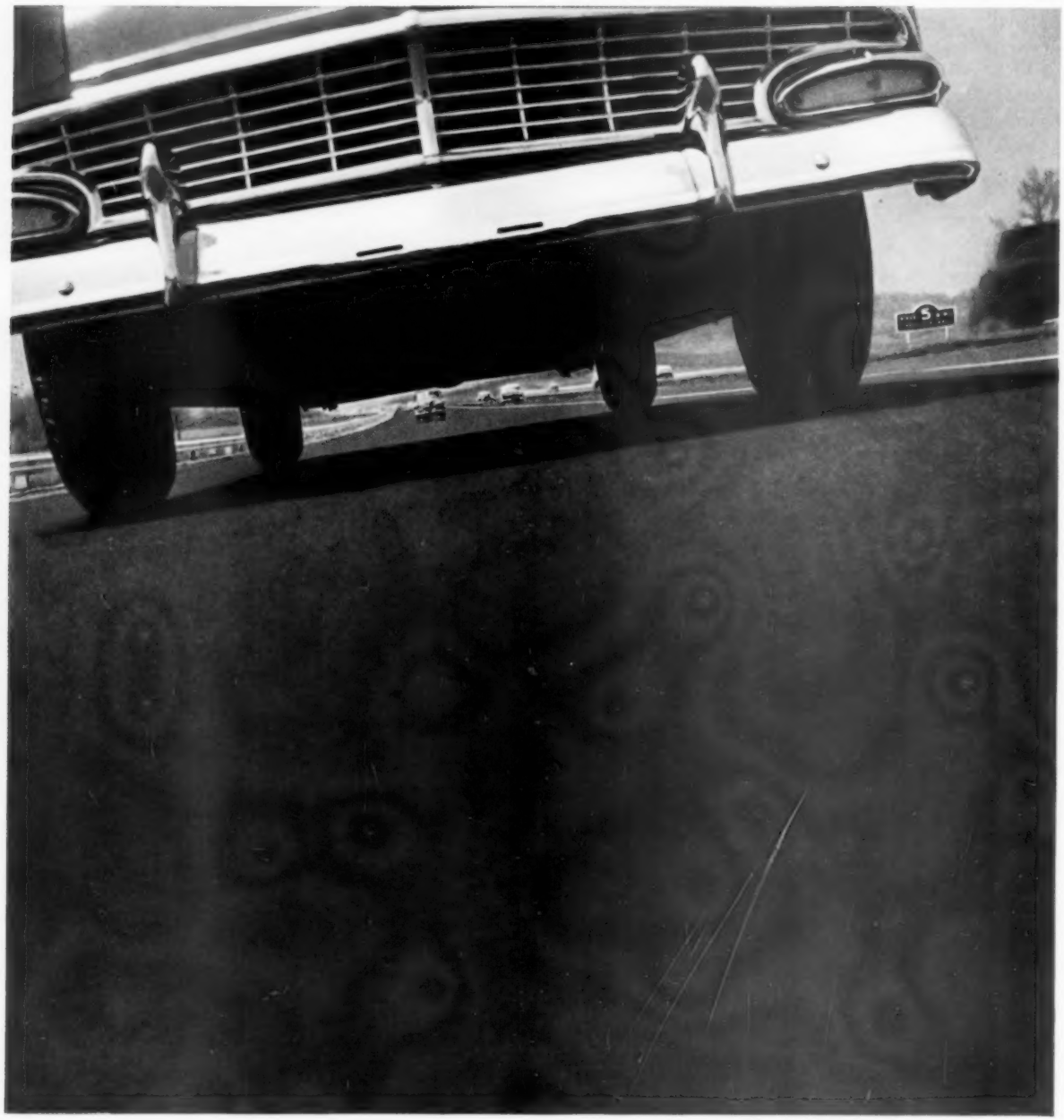

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PETROLEUM WEEK
Special Report

AUTOMATION

...WHAT IT WILL MEAN TO YOU

Here's what 60 men close to new oil technology say is coming . . .

REFINING

Despite giant strides in automatic operation, the "pushbutton" plant is a long way off. Needed: Better instrumentation and greater knowledge of refining processes **pp. 73-77**

PRODUCTION

Oil men will capitalize on new systems to handle automatically nearly all field operations —once crude is found. But automatic drilling won't be reached soon **pp. 78-82**

TRANSPORTATION

The trend toward centralized direction of oil movement will be speeded by a growing use of computers. Remote control will be getting new emphasis **pp. 85-86**

MARKETING

Automatic equipment at service stations and bulk plants is in for steady development. The greatest near-term gains will be in machine-handling of sales information **pp. 89-90**

MANAGEMENT

Electronic brainpower will come into general use to help companies get better, up-to-the-minute data. Intuition will be reduced. Stress will be on "optimizing" **pp. 93-94**

PEOPLE

Tomorrow's manager will have new freedom for broad thinking. Workers will have better jobs—not fewer jobs. Training will prepare all employees **pp. 97-98**

AUTOMATION

It Will be Part of Your Job

The clearest thing about automation is that it's now a business fact of life for you and your company. And, according to more than 60 men interviewed by PETROLEUM WEEK—oil managers, equipment makers, and consultants—we've seen only its beginning.

But not everything about automation is that clear. The word produces confusion and strong feeling. At one extreme are some oil employees who wonder if automation means a machine revolution that will disrupt their lives. At the other extreme are oil men who dismiss automation as a lot of shouting by newcomers who haven't heard about technological progress in the oil industry. Actually, automation is fairly close to the latter.

What Automation Is

In its effect on your work, automation is really only the development of automatic equipment at a faster pace than before. The word has been given various special meanings—such as "the substitution of machines for human decision and effort." It has been called "the use of machines to run machines." Some people maintain it must involve "closed loop feedback" or "servo-mechanisms" to be true automation.

All these definitions are valid. But the principles involved in each are not new. It is only the increasingly rapid development of automatic equipment that makes automation a big word.

How It Affects You

There is no question that automation will change your job, the work of your employees, and your company's operation. You need look no further than automatic custody transfer in the oil field, or the electronic brain at the refinery or sales office, to see how automation is reaching out to touch every oil man.

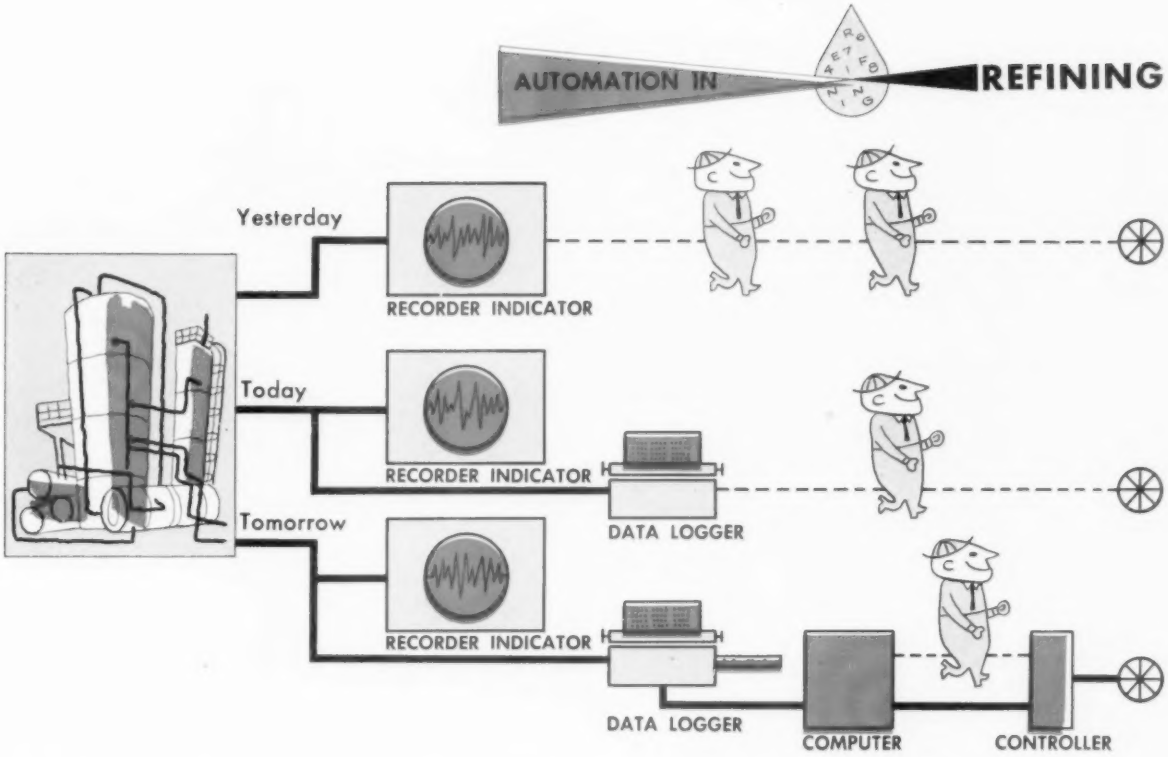
Automation won't turn your operation inside out. Changes can't be made faster than you and your people can digest them. But this doesn't mean that it's wise merely to let progress take its course.

What Automation Requires

As in the past, the oil men who best understand changing technology will be the leaders in the years ahead. Automation requires study of new techniques and the use of new tools being made available for your area of work. But it also requires knowledge of what is happening in other departments and in other segments of the industry. This is because the big gains from automation come when it is used to link, and then to "optimize," diverse operations. Great value will be placed on broad knowledge and "integrated thinking."

●

It is because of these requirements that PETROLEUM WEEK has prepared the Special Report beginning on the next page. A cross-section of the most informed industry opinion from coast to coast, the report provides "integrated" coverage of oil automation. It starts by showing where automation is headed in each part of the industry. It concludes with a close look at where your management, and you, will fit in tomorrow.



More Automatic Controls Are Coming

But the automatic refinery is a long way off. Holding back further progress is the need for (1) improved reliability and accuracy in primary sensing instruments, and (2) more knowledge of refinery processes.

Automation has made its greatest strides within the oil industry in processing operations. But the completely automatic refinery is still a long way off. In fact it's too far distant in the future for process engineers even to guess when it may come.

The very nature of petroleum processing—the continuous movement of liquids and gases from crude oil storage at a refinery to end product storage—encourages automated operations.

There are a lot of automated operations in use in refineries and petrochemical plants already. And a lot more are technically possible.

In fact, instrument specialists today can design an entirely pushbutton refinery which, once started up, will operate automatically and efficiently. It will even "repair" itself to a limited extent.

A very few companies now are planning to use an "automated" approach to gearing their refinery operations to short-term changes in supply, demand, and prices at the market level.

They will gather information on daily trends from their refineries and marketing outlets. The problems of desired yields and throughput rates will be solved on automatic computers.

But so far, the automatic "feedback" of data from the market area to control refinery operations directly is a missing link.

More Automation for Quality Control

While the fully automatic refinery is not near at hand, there will be a steady trend toward more automatic controls.

The competitive push for closer control of product quality dictates such a trend. And closely associated with the desire for maximum product-quality control is the competitive economic incentive for obtaining better yields.

Many refiners feel that improvements in instrumentation will bring closer control of unit operations.

A big step in the direction of better control of product quality is the growing trend toward continuous automatic blending of gasoline. Sometimes called stream blending, it is a technique for the automatic final blending (after the actual manufacturing operations) of the numerous components that go into finished grades of gasoline.

Continuous on-stream blending—which in some refineries is computer-controlled—permits refineries to make up any blend and pump it direct to tankers or pipelines.

The advantages of such a method over the older batch-blending technique is that it offers increased tank utilization, eliminates reblending of off-specification material, prevents "quality giveaway," and permits blending closer to ultimate specifications.

One of the most recent new developments in new on-stream analysis is Esso Standard Oil Co.'s application of a gas chromatograph for automatic analysis of some components in the No. 2 polymerization plant at its Bayway (N.J.) refinery.

The evolutionary development of refinery automation

YESTERDAY'S control house required a monstrous instrument panel. Several operators were needed to record data.

TODAY'S control house, with graphic panels and coming automatic loggers, relieves operators for other duties.

is most easily noticed in the gradual trend toward centralizing process instruments in control houses.

Next came the development of continuous recording instruments to measure temperatures, pressures, and flow rates. Then came the graphic instrument control panels.

A more recent development—still in limited use—is the application of automatic loggers in control houses to record the analog data from process instruments in digital form.

Data loggers can record the complete process data variables of a process unit in typewritten form at pre-set intervals. Or they can continuously scan the data variables during unit upsets. The loggers can record data in a fraction of the time required to log the information by hand.

The loggers also perform such computations as hourly integrated flows, total average flows per hour, unit material balances, efficiency ratios, and yield factors.

Refiners say the ultimate goal in petroleum processing automation is automation that will make the most efficient use of machines and men.

Simply stated, the goal the refiners have in mind is relieving engineering personnel of the job of gathering, compiling, and calculating routine process data.

As such a trend continues, it would gradually reduce the human function in process operations to that of decision-making.

The most efficient use of automated equipment of all types doesn't necessarily mean completely automatic processing operations.

An "automated unit" implies computer control of a process operation.

Many refiners tell PETROLEUM WEEK that they are not convinced that the computer control would offer any advantages over human control now exercised in most process units. (These refiners do not dispute the many advantages of computer control in gasoline blending. The blending of gasoline, though, is not a process operation.)

In many units, a once-a-day computation would probably be all that would be needed. The computer, controlling a unit, therefore, would be idle or on "made work" for the remainder of the time.

Also, refiners admit that even with the development of practical economical computer control of a process unit, there is not enough knowledge of what goes on in a process to determine just what additional data should be computed.

Refiners' real interest in automation is the payout. Automation involves expensive equipment.

Many of the automated controls needed today are "custom built." There are a few basic components that are standard. But, often, a refiner needs the range of a controlling instrument changed or a new function added.

While some of these changes are minor, they require a lot of hand work and more calibration to gear controlling instruments to process units.

One eastern refiner describes the payout of automation in simple terms: "We can hire a good unit operator for $10,000 a year, including fringe benefits. Such a figure won't buy much in the way of instruments or computers. And a good operator is far more versatile."

And it's the payout that will determine in which areas of petroleum processing automation will make the greatest gains.

Many refiners say that process operations are already automated to such an extent that few major cost reductions can be realized by further automation.

Refinery process operations now are at a nearly irreducibly low manpower level per unit, according to one process man who is studying the field of refinery automation.

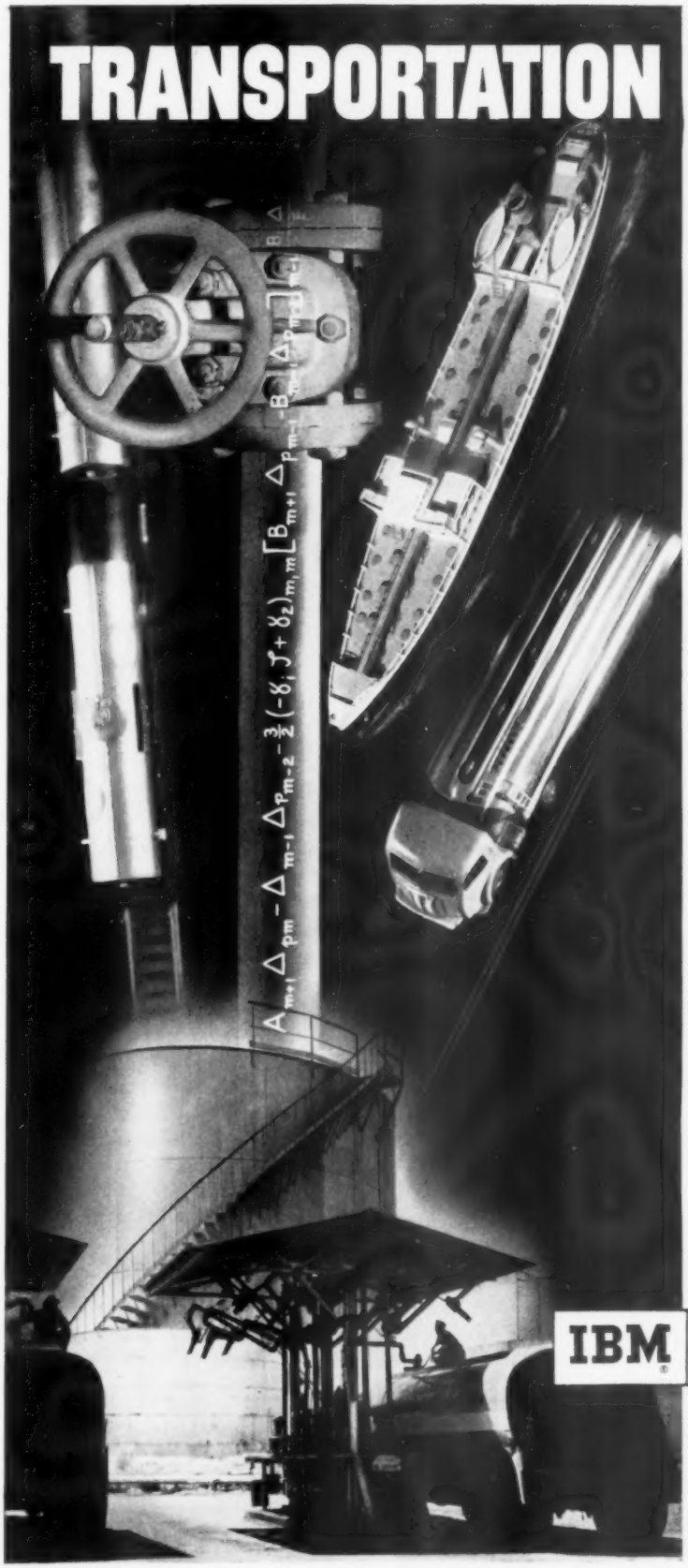
"We operate some units now with one man per shift," he continues. "We will always need one operator to stand by for emergencies—if for nothing else. While he's on duty, we believe that it's best that he's doing some work connected with the operation of his unit. We think the operator can control a unit better than a computer can."

Automation to Cut Maintenance Costs

The potential payout of automation would indicate that among the most promising applications would be those that would help to lower maintenance costs or reduce the "routine burden" on technical manpower.

Much progress is being made in the use of computers in refinery engineering departments to relieve technical people of tedious routine calculations. And a lot more automatic engineering calculations will be made in the future, when, as one refiner puts it, "we learn more from process operations on what we can compute."

One growing use of automatic computers is in refinery simulations—an application that relieves engineers of some



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To speed the seismic results on which well locations are based, many forward-thinking companies are converting today to centralized interpretative offices, utilizing the seisMAC, Seismic Magnetic Automatic Computer. This advanced processing instrumentation, developed by Houston Technical Laboratories, resolves seismic data to its most workable form for final interpretation . . . with far greater speeds than hands can move and minds can think. The seisMAC also offers complete adaptability (with the minimum obsolescence factor) for use with the Section Plotter, Migration Computer, and Shot Compositor . . . other instrumentation that is destined to play a vital role in future oil explorations.

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routine calculations and, in effect, provides a certain degree of process control.

The purpose of simulating a refinery on a computer is to work out a "refinery balance" for all process units. This would probably be done no oftener than about once a month.

Planning of future operations is based on market demand, crude supply and type, and process yield data. It is similar to the "automated" approach to gearing operations to short-term shifts in market trends.

Still, there are only a few refiners that are even considering this application on a day-to-day basis.

So-called "automated maintenance" is a new concept of automation. It's a necessary step toward the fully automatic refinery. But it's only in the "dream" stage now.

Maintenance is the largest single item in refinery operating budgets. It accounts for between 30% and 50% of refinery operating expenses.

There is a certain amount of "self-repair" equipment in use. It consists mainly of such equipment as spare pumps that are instrumented to start up automatically if a main pump fails. A standby instrument air system is another example. But the use of such "self-repairing" equipment is extremely limited.

In many applications, self-repair is considered "technically possible," but not "operationally possible"—at least with present equipment. Some equipment—particularly some of the electronic devices—just can't be started up "cold" to full process operational level without a "warm-up" time lag.

One refiner says that, instead of developing self-repairing equipment, involving automatic throwing of switches, it would be enough if instruments were available to "anticipate" automatically shutdowns and equipment failures.

"Turning a valve or pressing a button to start up standby equipment can be quick and simple," he says. "But what we want is help on knowing when to start up standby equipment. The need in the event of failures or upsets is to make the necessary changeovers before a whole unit shuts down and product is lost, or a large volume of off-specification product is made."

Better Instruments Are Needed

The big move in refinery automation to relieve engineers of routine calculations is slowed by the lack of reliability and accuracy in primary sensing instruments.

Those are the basic instruments in refinery control. Flow meters, a basic form of essential instrumentation, still are far from being accurate enough and reliable enough to provide the kind of information needed for computer control. Such comments on flow meters, as well as other basic instruments, come from refiners as well as instrument companies.

The comment most frequently made is that meters are accurate enough when first received from a manufacturer, or when they come back from repair shops. But they lose calibration fast.

Meters are only part of the big field of primary sensing elements. All refiners say there is an urgent need for better on-stream analysis instruments of all types.

New continuous, automatic instruments for on-stream analysis are needed to reduce the lag between an event in a process unit and the analysis of the event.

After better primary sensing instruments are developed, then the secondary instruments—those that gather and reduce process data—will have to be made more reliable—and less costly.

Such secondary instruments include automatic data loggers and computers of all types.

The head of the refinery engineering department of one large integrated company says that the advantages of automatic logging are such that "we would put them in all of our refineries, except for one reason. And that reason," he says, "is that loggers still have a lot of bugs in them."

Many refiners say that the equipment is fine for short-term operation, but that that's not what they need. When refiners speak of reliability of operation, they are talking of equipment that can operate without attention for 18 months to two years.

Another oft-heard complaint from refiners is that complexity of the "self-checking" mechanisms in such instruments can defeat their purpose in some instances.

For example, if something goes wrong with a computer, and it can't work through to a solution of its problem, then it just shuts itself down.

For a computer controlling a refinery process unit, a computer shutdown could stop the unit. And it's to prevent unit stoppages that refiners would want automatic controls—not to increase the chances of shutdowns.

The first step toward improving instruments is better communication between refiners and instrument manufacturers. Both agree on this point.

Refiners admit they will, first of all, have to learn more about the "why" of processes. Many refiners say that their lack of knowledge of what really goes on inside a unit means that they are only able to "second guess" their instrument needs.

Basic Instrument Research Starting

The next step is more basic research on instrumentation.

The lack of research on developing new instruments is simply a lack of money. A top official of one instrument company says: "It is not economically feasible for any instrument company to get into the expensive basic research that we all know is needed to develop new concepts in instrumentation and control. None of us is big enough to afford such a program."

All instrument companies are conducting research on instruments. But their programs are mostly of the "applied" type, rather than basic research on new concepts.

The most promising hope for effective basic research in instrumentation is the new industrywide program of the Instrument Society of America.

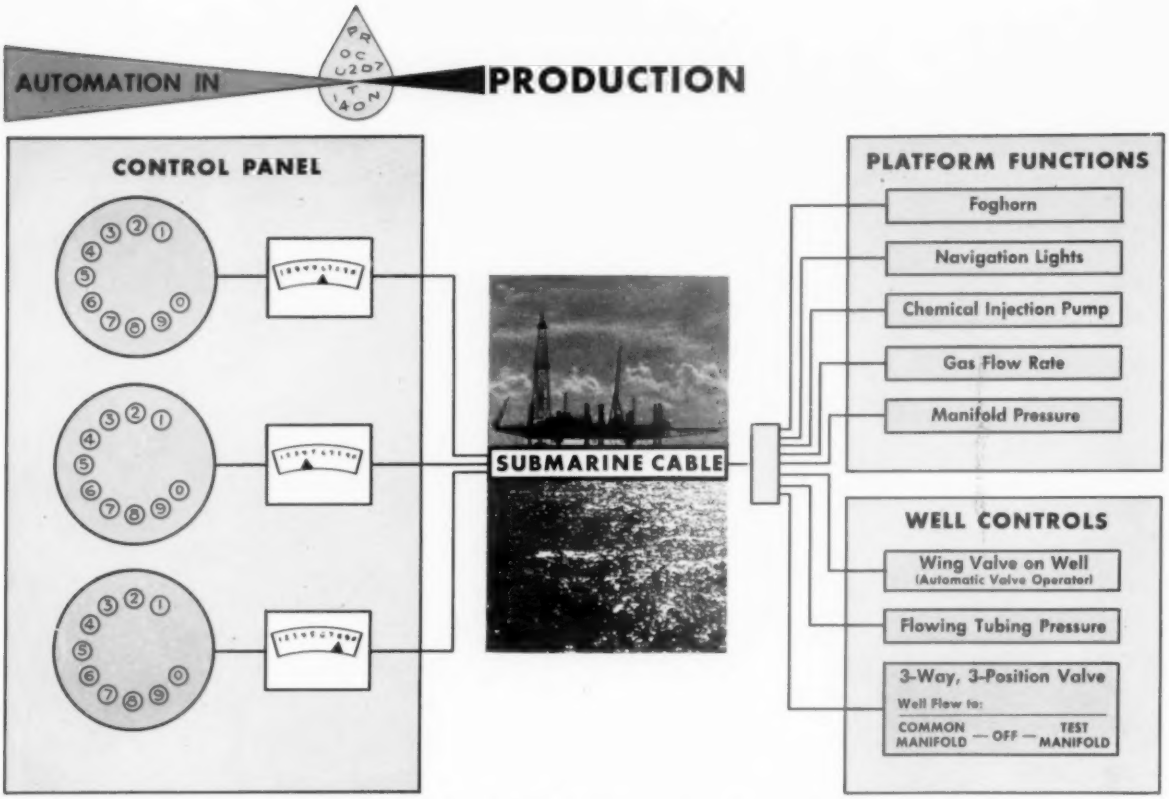
This program, which was started last month, is a joint educational and research program. Its purpose is to determine the areas of basic research.

Dr. Robert Jeffries, assistant to the president of Daystrom, Inc., who is heading the ISA program, explains its operation as follows:

"Teams of instrument-industry men are determining the areas of needed basic research in each major field. Once those programs are decided upon, the basic research could be conducted by various nonprofit research foundations, or universities. The funds to support such a program would be provided by instrument companies.

"As of now, we would like to place this type of basic research on new instrument concepts in universities. In that way we would get the research done and would also be encouraging more students into the fields of instrument research. Both the research and the education in instrument development is badly needed."

AUTOMATION IN PRODUCTION starts on p. 78



REMOTE CONTROL of offshore producing wells. New McEvoy Co. system allows onshore control through underwater cable.

Drilling Is Lone Holdout in Oil Fields

Nearly all operations in the oil field can now be handled automatically—once the well is completed. But drilling still baffles researchers.

Drilling—the "guts" of the producing end of the oil industry—is the last frontier, the major obstacle, and the big challenge to full automation in the oil patch.

As it stands now, automation can step in when the well is completed and handle—by automatic controls—all the various steps that the oil passes through from wellhead to pipeline.

There still are some "bugs" to be ironed out, however, in the various experimental and operating systems now under way. Further improvement of those automatic systems can be expected, in the natural course of technical progress.

At least one effort has been made to build and operate a drilling rig that would convert roughnecks to push-button clerks. But it failed.

Humble Oil & Refining Co.'s "laboratory" drilling rig No. 30 was placed in experimental operation in Sugar Valley field, between West Columbia and Bay City, Tex., back in 1948.

The giant rig represented more than three years of research into drilling problems. There were 30 new pieces of equipment on the rig, of which a dozen were considered "radical."

Perhaps Rig 30's most striking feature was its ability to pull as much as 10,000 ft. of drill pipe, stack it, and run it back into the hole, with no physical exertion by the crew.

The experimental rig was not designed to eliminate all manual operations—one of the basic aims of automation—but it did reduce the number of men required over-all.

It was believed that by reducing the fatigue of the drilling crew, both efficiency and safety would be improved. The automatic equipment would permit the crew to deal with general operation of the rig, and technical matters, rather than give physical assistance to it.

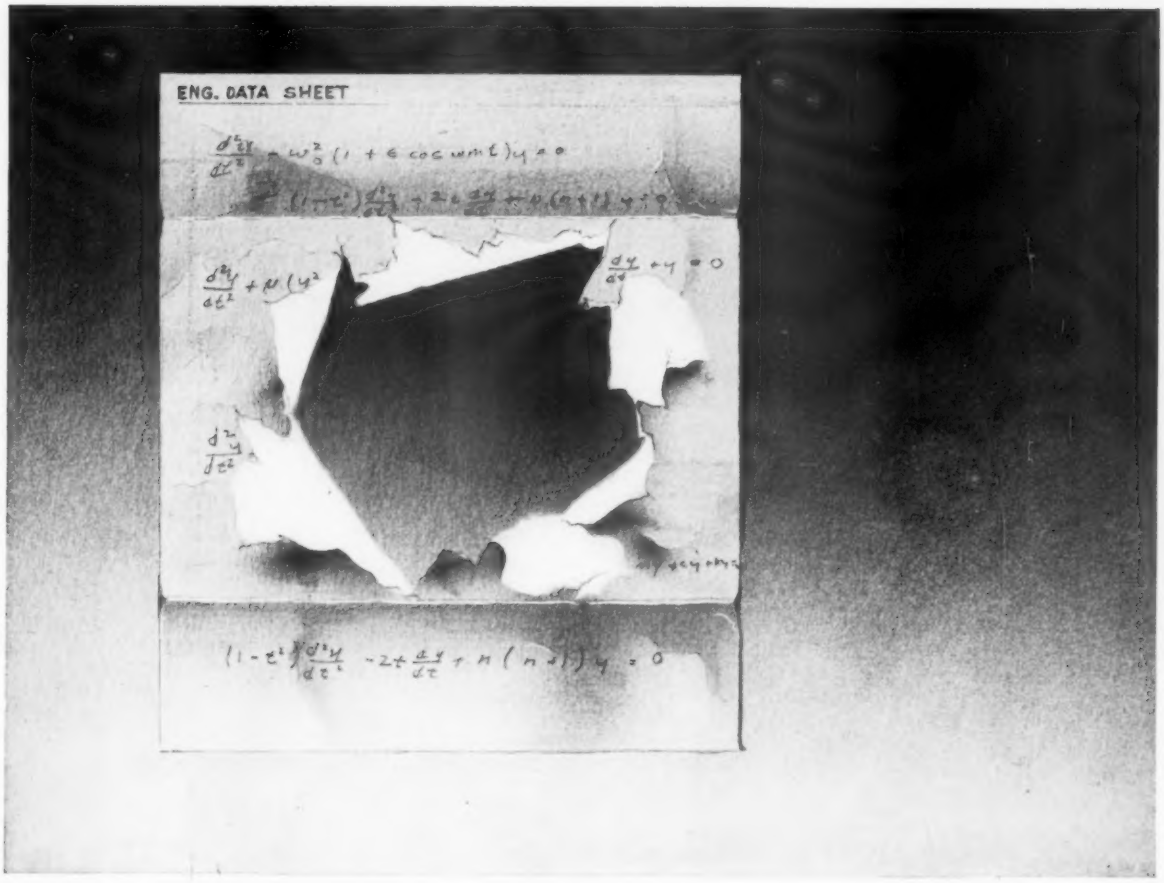
But some "kinks"—which Humble hasn't explained—developed. Humble engineers weren't able to iron them out, and the rig was stacked a couple of years ago. Further research continues, however.

Within the next year or two, some automatic drilling processes—such as pipe hoisting and racking—may be perfected. But these developments also will only reduce manual labor, not eliminate it.

Many of the power features that made Rig 30 unique are, or are becoming commonplace. Power tongs, for instance, now widely used, have also proved to be the safest and most reliable method of running casing.

The turbodrill, too, may have wide impact on automation in drilling (page 45). One research official of a manufacturing company says that turbodrills "might make automation worthwhile on a drilling rig."

If you can pick up and lay down your pipe automatically, he adds, it would add to the value of turbodrills. As they



Break Through The PROBLEM Barrier

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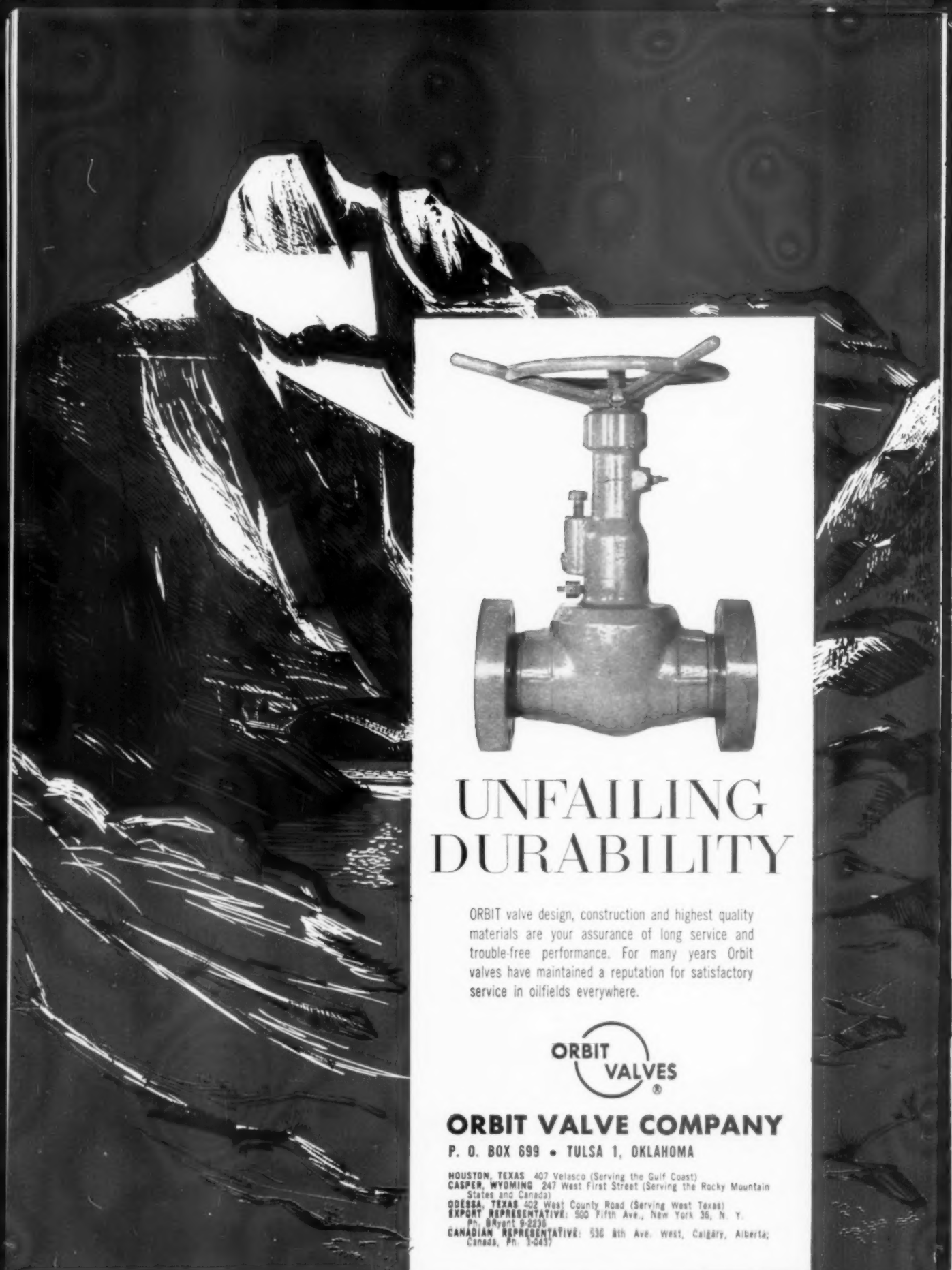

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stand now, turbodrills still require a considerable amount of going in and out of the hole.

It seems generally agreed that only a completely new approach to the drilling problem (perhaps atomic power application) can really resolve the automation question in drilling. As long as the present concepts of drilling are followed, complete automation seems out of reach.

Automatic Lease Operation

Once the hole is drilled and the well completed, however, automatic lease operation can now take over.

Upon completion of the well, there are several basic operations involved in the production and transfer of oil or gas from producing lease to purchaser.

These operations can be broken down into these categories: (1) control and scheduling of well production; (2) periodic well-performance testing; (3) separation and storage of gas and oil production; and (4) running, measuring, and witnessing transfer of crude oil from lease storage to the pipeline.

Additionally, there has been a tremendous surge in the development and use of semiautomatic tools.

These have brought increased efficiency and reduced operating costs, in most instances. (One major company, using clock-operated shutdown devices for its gas engines, reported annual savings of $20,409, against initial outlay of only $5,690.)

Labor-saving methods, such as the use of grooved couplings on line and tank-battery installations, and standardization of tank batteries, are also finding wider use in oil production.

Automation in the oil fields has several advantages, perhaps the most important being an increase in the productivity of labor.

Automation also:

- Reduces usual tank-battery and pipeline facilities.
- Gives complete and accurate production-engineering information.
- Reduces stock-tank vapor and tank-cleaning losses.
- Aids in gas-oil ratio and water-control to conserve the reservoir drive.
- Reduces "paper work."

Automatic Custody Transfer

Automatic custody transfer has been the most recent—and one of the major—developments speeding the push toward the completely automatic oil field.

API defines ACT as "the automatic determination of quantity and quality of crude oil in conjunction with the automatic running of that oil into the connected pipelines on an unattended basis and in accordance with any predetermined schedules required."

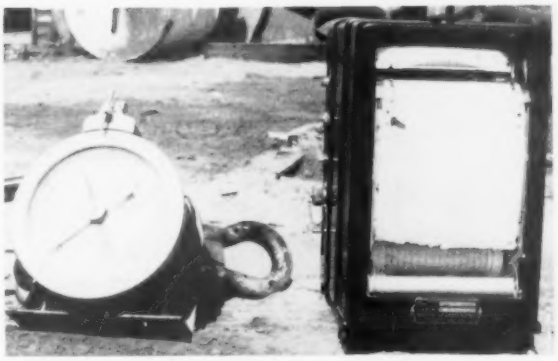
ACT is still so new that API has not been able to set up a firm standard of practices.

Until a few years ago, all crude oil run from producers' tanks was measured, sampled, and tested by the use of hand tools. In 1954, API approved use of automatic indicating gauges and thermometers.

ACT is still far from being a common practice in the oil fields. Economic and geologic barriers are the primary blocks.

A top engineer from one of the companies manufacturing automatic equipment says:

"This automation stuff, so far, is mostly talk.



DRILLING AUTOMATION is being advanced by this new power tong "Tellemeter" of Sherman Power Tongs, Inc., Odessa. It gives the driller a remote record of foot-pounds of torque used in tightening each joint of casing, time spent on each joint, number of joints, and total time in running well casing.

"We have demonstrated the technical feasibility of the equipment. The engineers engaged in the field work are enthusiastic about these labor-saving devices. But management has just so much capital to spend.

"So far, management has been inclined to use its capital to drill up more wells and find more oil.

"Automation won't produce one more barrel of oil. So, while we have developed and can supply automatic control systems, actually we are keeping as busy as we can supplying the more orthodox types of control equipment."

H. Ross Bolton, vice-president of production and exploration for Crescent Corp., Tulsa, says he thinks ACT has a lot of room in which to grow in the future.

"Not every lease is adaptable to automatic operation," he says. "Usually, for one, you've got to have good pipeline facilities to go along with your production."

A field engineer for Union Oil Co. of California says: "We're aware of it, and we've used it in a few places. Essentially, though, it's a matter of economics. Saving in labor is the only real justification for it."

Most automation experts agree that logical areas for conversion to ACT are new leases or secondary recovery projects, provided adequate pipeline facilities are available. Big growth can be expected in these areas within one to three years. Within a decade, such practices should be common, they say.

The Equipment Picture

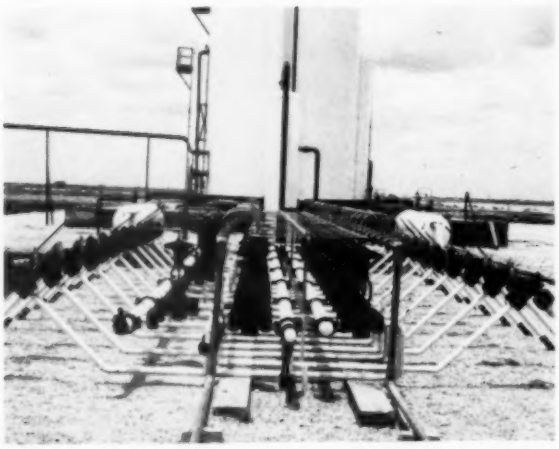
The vast potential of the automation market in production has touched off a heavy rush of activity by a growing number of companies, each trying to come up with new, improved equipment and methods.

Much of the equipment on early automatic leases was custom made, and expensive. While there is much room for improvement, equipment now is available at reasonable prices to relieve the pumper of many routine duties.

In fact, there are some complaints that some phases of automation in production are developing too fast.

Two Sun Oil Co. engineers—K. E. Montague and F. E. Buchanan—told a technical meeting in Los Angeles last month that electronic reservoir engineering "brains" are such "gluttons for data" that their human helpers aren't fast enough to collect and organize problems for them.

The Sun engineers suggested that new high-speed digital



AUTOMATIC LEASE of Shell Oil in Wasson Field, Tex., estimated to cut operating time by as much as 85%. Shown here is the header design used on the first installation.

computers be developed to help prepare such routine problem-assembling information. "It should not be too difficult to tie the whole producing mechanism into a giant electronic control system," they said.

H. H. Rachford, Jr., of Humble Oil & Refining Co., says that as fuller understanding of logging data is obtained, more processing for full interpretation will be needed.

"Such computers would permit a more elaborate and closer look at more logs at less cost than their human counterpart, thus freeing the latter to give more time to original and creative work on unusual situations which the computer sorts out," he says.

A partial answer to the problem of providing routine data automatically is a gas analyzer developed by Beckman Instruments, Inc. The instrument measures up to six gases in a single sample.

In addition to use in process flow operations, the instrument will provide important basic information in exploratory work, such as oil well mud logging.

Most automatic tools being introduced, however, are bridging existing gaps in the automation process, or are improvement of present automatic tools and methods.

Early lease operations had considerable trouble due to failure of float-operated switches to actuate control valves. The Dynatrol Level switch, developed by Automation Products Corp., has proved superior for such control of high-low, liquid-level limits.

Win-Well Manufacturing Co., of Los Angeles, has developed a "seven-way multiport rotary selector valve," which is not a valve at all, but a manifolding system, which is being put to new use in automatic testing of wells. The unit permits connection of seven input lines to a single output line. This central source eliminates need for complicated, expensive manifold systems in testing, metering, and sampling.

Avion Division, ACF Industries, Inc., has designed a new Remote Oil Well Production tester. The unit collects production data at a well location and transmits it to a central point (PW—Dec.16'55,p15).

This equipment gathers such data as oil, gas, and water production, gas lift consumption, and tubing pressure, in addition to signaling the well number, test interval, and data gathering station number. From the gathering station, a radio line, two-wire circuit, or leased line may be used to transmit the information to a central station printer.

This unit now has been installed in the California Co.'s Bay Marchand field, in the Gulf off Louisiana, where it is in experimental operation.

Another, different system has just been introduced by McEvoy Co., of Houston. Called a "multiwire control system," it is designed for transmission distances of 5 mi. to 10 mi. (Previous McEvoy systems operated 10 mi. to 100 mi. via radio signal transmission.)

Next: Offshore Automation

The big push in automation in the next year or two will likely come in offshore work.

Operators are likely to come closest to realizing a completely automatic oil field in remote offshore locations, where labor savings would be far greater. The tremendous logistical problem facing offshore operators makes it much easier to justify expenditure for automatic systems.

Says one operator: "We have to spend $175 a day just to haul a switcher around out there. It's plain ridiculous."

In The California Co.'s Bay Marchand operation, four wells on one production platform are hooked in. Each of the wells is placed on test automatically in rotation. Data on amount of daily production, breakdown on gas, oil, and water produced, amount of gas utilized for gas-lift operation —all of this for each well—is automatically transmitted to tape at the storage terminal office onshore.

Everything is done automatically. There is no directing of operations by remote control operation.

Phillips is putting an automatic system in Block 129-B, Eugene Island area, off the Louisiana coast. This will be a composite system involving types of equipment produced by various manufacturers.

The Challenges Ahead

Increasing labor and material costs are likely to make automation even more attractive in the years ahead. Hence, research can be expected to step up.

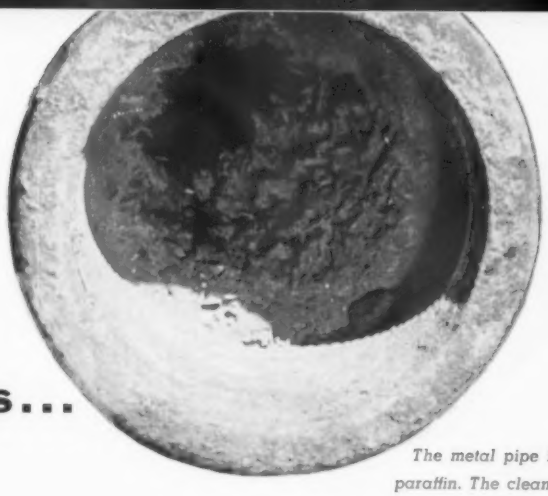
Some researchers are thinking along these lines:

- If automation is not entirely adaptable to operations as they are now practiced, why not change the order of these operations, maybe even change the accounting system to reduce the amount of equipment needed?
- Since cuts are difficult to determine over a wide range, why not dehydrate first, and then calculate the cut from more accurate measurements of clean oil and clean water?
- To measure natural gas volumes, why not use a parallel arrangement of meter tubes and selectively close valves on the tubes until the differential pressure is being built up to an acceptable measuring value?
- Closed-circuit TV systems could have application for remote observation, or data gathering.
- Acoustic flow meters might be usable in some circumstances.
- Radiation absorption meters employing gamma ray sources are possibilities for measuring flow rate, liquid level, or liquid density.

Economics, necessity, and ingenuity will determine how soon today's ideas will become tomorrow's realities in the oil field.

AUTOMATION IN TRANSPORTATION starts on p. 85

When metal pipe looks like this...



The metal pipe is almost completely clogged with paraffin. The clean Tenite Butyrate pipe has been in service for months on a high-paraffin oil line. (Paraffin accumulated only on the steel pipe connector.)

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AUTOMATION IN TRANSPORTATION

FINGERTIP CONTROL of midwest pumping station is maintained in Shell's New York "nerve center" by machines like this.

AT A GLANCE, dispatcher can determine line conditions, plotted from incoming data. In next step to central control . . .

Computers Will Figure Flow Schedules

Electronic scheduling will join telemetering, remote actuators, and other technological advances to give tighter transportation control.

The day is almost here when electronic brains will be grinding out oil and gas transportation schedules.

Several companies are already setting up medium-size computers to figure out optimum pipeline runs:

- Great Lakes Pipe Line Co. expects to start operating its new Burroughs "Datatron" early next year.
- Plantation Pipe Line Co. is within a year of asking its new IBM "650" computer for daily line schedules.
- Northern Natural Gas Co. is working out a system to feed gas measurement and marketing facts to a computer.

In addition, Shell Oil Co. is considering use of a computer to program its Mid-Continent products shipments. And Interstate Oil Pipe Line Co. is doing some research on the smaller computer used in its accounting office, to work out an approach to larger machines for field problems.

A couple of major oil companies are also trying to see if computers are practical for tanker scheduling. And Great Lakes has made some preliminary computer tests concerning truck programming at terminals.

Why Computers in Transportation?

"Computers are becoming a necessity," says a Midwest pipeliner.

"Every segment of the industry is trying to increase facilities and increase efficiency, too. Getting the right crude or the right product to the right place at the right time is getting to involve more and more variables for those of us who must move the stuff—particularly since we've got to consider the changing conditions of our equipment.

"With computers," he adds, "we hope to be able to shake up everything—shippers' proposals, customers' demands, our equipment status, and our business policies—and come up with the ideal schedule. After that, we should be able to feed in each new variable as it develops (a sudden market demand or a pump breakdown, for example) and get a fast revision of our schedule."

The gas-pipeline, tanker, and truck programming plans are also pegged to the same proposition: a faster, more comprehensive analysis of the factors that influence transportation timing.

Computers may also influence the techniques of transportation.

"We can't afford to play around with our systems right now," says another pipeliner. "But we could work out our ideas on the computer. Suppose, for example, somebody gets a notion that maybe we could stop pumping on Tuesdays. This is a ridiculous notion, of course. We'd never stop pumping on Tuesdays. But, by golly, on a computer we could find out for sure just what would happen if we ever did stop. And maybe it wouldn't turn out to be so ridiculous after all."

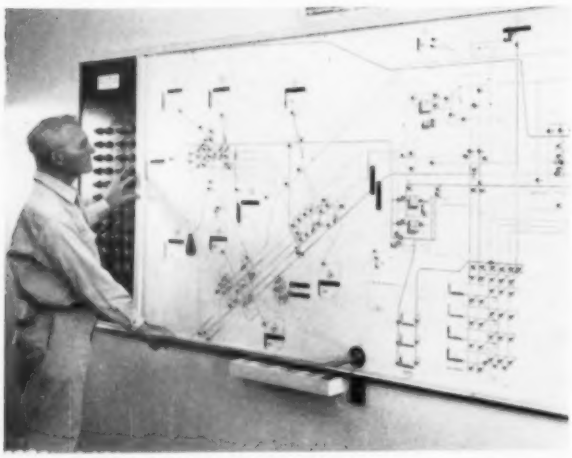
There are, of course, some transportation experts who are not computer enthusiasts.

"Our scheduling system works fine," says one pipeline department manager. "We don't foresee any need for a change."

"A computer," says another pipeline executive, "will generate errors faster than any other means available to man."

The computer emphasis, however, is only part of current technological development that's aimed at closer centralized control of oil and gas transport systems.

Shell Oil Co.'s control of its products flow east of the Rockies is a broad example of the centralization principle. The flow is supervised from a small "nerve center" in New York. Here the chief dispatcher gets constant information about line conditions and batch locations. And he



PUSH BUTTONS activate both gathering and pumping operations at Rio Bravo station of Standard Oil Co. of California.

controls the pumps and valves—in some cases by push buttons connected directly to booster stations in the Midwest, in other cases by signals to each station operator.

This "nerve center" will be operating, starting about Jan. 1, in a new field office that Shell is building in Indianapolis. This will only put the dispatcher closer to the lines—and cut down communication costs. The principle of centralized control will remain.

Central Control Can Go Just So Far

But there's little likelihood that pipelines—the most susceptible to automatic controls—will ever be completely automatic.

"There's no doubt," says an oil company executive, "that with existing hardware (instruments, controls) we could eliminate all manpower in pipelines.

"There are telemetering devices to monitor the system, loggers to record the data, computers to digest it and suggest responses, feedback systems to carry the responses back to the field, and remote-control devices to carry them through.

"But it just ain't practical," he adds, "and probably never will be."

One of the big drawbacks to all-out automation is the size of the communications system required.

"Refiners," says an engineer, "pioneered the field of automatic operations. They could; their units are all at one site. In a transportation system, you've got to link units hundreds of miles apart. If we were to buy all the instruments available, we couldn't afford the wires, or the radio system, necessary to operate them. And even if we did spend that kind of money, we wouldn't be a pipeline company with a communications tool—we'd be AT&T with plumbing."

Another pipeliner questions the reliability of present communications systems. "If I'm talking to a station operator on the telephone and he garbles a syllable," he says, "I still know what he's talking about. But if a pulse system misses a beat, I'm lost."

Then, too, there's the attitude of individual companies about personnel. Most pipeline companies are striving for one operator per shift at main stations, plus a utility man to spruce up the place, and maybe an engineer for maintenance and repair. "It's well worth the money just to have somebody near the equipment," says a crude-line manager. "And he may as well have some buttons to push."

"We consider our manpower an investment, aside from other considerations," says a major company's transportation coordinator. "We don't scrap manpower, any more than we'd scrap machinery, whenever a newer way of doing things hits the market."

Hand Gauging Is Outmoded

One job that seems to be on its way out, though, under the impact of new methods, is that of hand-gauging of storage tanks.

Many of the transportation experts polled by PETROLEUM WEEK predict a widespread increase in storage-tank telemetering—remote reading of fluid level and temperature, instead of the traditional tank-climbing by a man with a tape and a thermometer. (The gauger's "thief" is replaced by having samples taken from the pipeline, instead of the tank, for analysis.)

"We've kept close tabs on our gaugers and on our remote reading equipment," says a terminal supervisor. "And we're convinced that sending a man out for readings is as old fashioned as kerosine lamps on a Cadillac."

What will happen to gaugers? "We'll find room for them someplace else in the company," is the almost invarible response.

Telemetering equipment is only one threat to the gauger's job. The tanks themselves may be on their way out as measuring units.

"The trouble with making out run tickets based on tank readings," says the operator of a tanker loading terminal, "is that you tie up your tank for each ticket. You can't start filling it, to replace what you're putting aboard a vessel, until you've emptied the tank or until you've finished the loading. To avoid loading delays, you've got to invest in alternate tankage. With meters, we wouldn't need as many tanks as we have."

Before any major trends get under way, though, transporters may look for better meters.

"We're building one of the most modern tanker terminals we could design," says a spokesman for a foreign-operating oil company. "But we haven't been able to find meters that would be big enough to handle the flow rate that we anticipate. We'll probably have to hook them up in pairs."

More-basic points are raised when it comes to selecting the type, rather than the size, of the meters. A sample comment: Positive displacement meters are more accurate than flow indicators, but the latter are ideally more simple in construction.

"The problem isn't serious, as long as the economics and desirability of metering may be demonstrated," says a pipeline engineering consultant. "If you want meters, the manufacturers will develop them for almost any purpose. And they'll probably come up to standard.

"But no manufacturer will ever make everybody happy. Some engineers swear by electronic valve actuators, for example. Others would rather rely on pneumatic pumps, hydraulic systems, or some combination device. A lot of these guys will always find reasons for not doing things. But the companies that do keep finding ways to use modern tools and techniques will end up on top."

AUTOMATION IN MARKETING starts on p. 89 ➡

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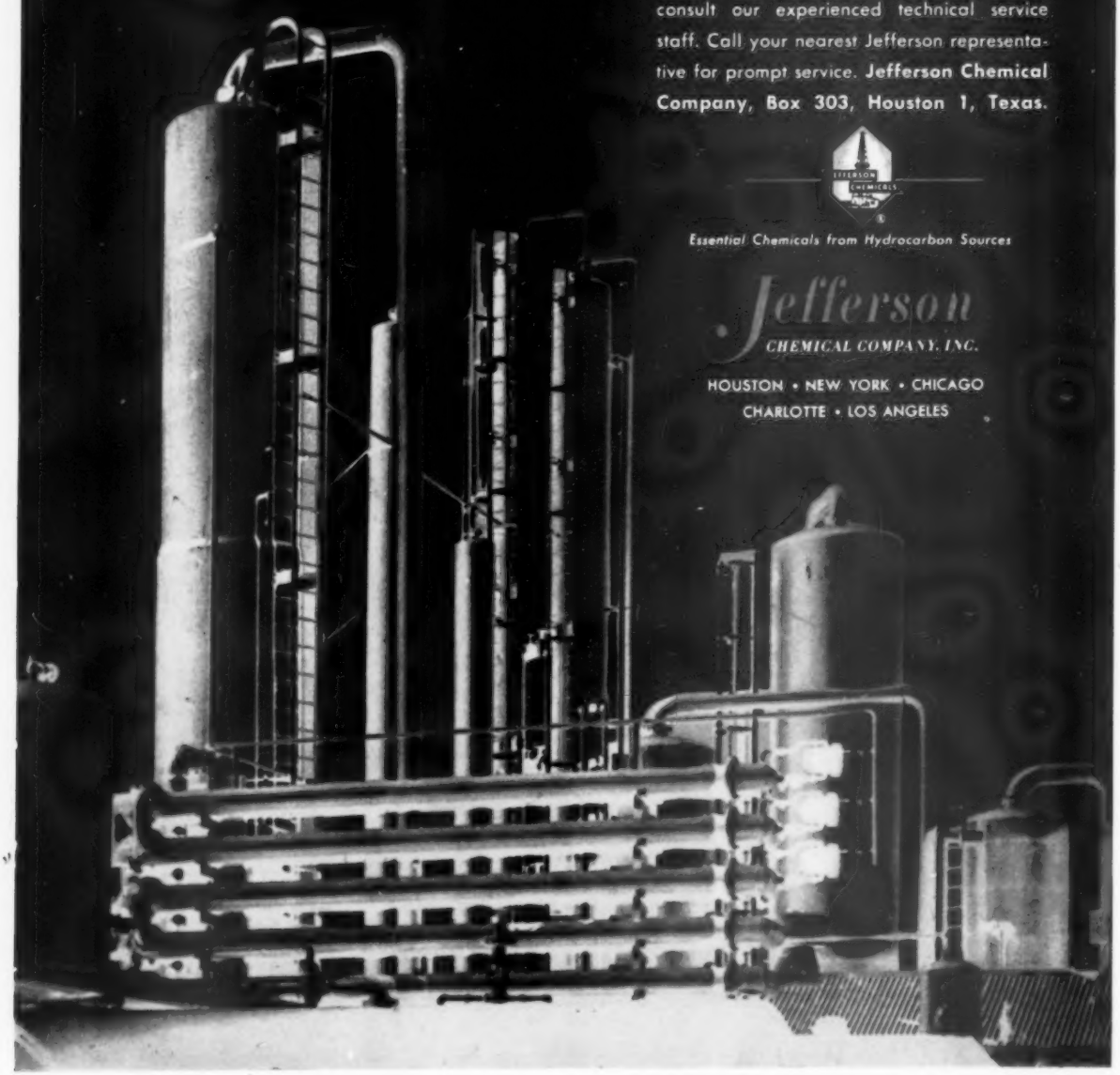

The Changeover Will Be Gradual

Equipment at stations, bulk plants, and sales offices is in for steady technological development. But a "revolution" is a long way off.

Automation in oil marketing is running smack into the large, yellow "go-slow" signal.

Until now, technological advances in marketing have, for the most part, kept up with the progress made in other segments of the industry.

The service station provides the most obvious example of marketing's advances. In gasoline pumping at the station, progress has been twofold: in introduction of new pumping units to bring fuel up faster, and in new, more efficient, metering systems to gauge the amount of fuel delivered.

But product handling isn't the only area of station operations to be improved by new mechanical systems. The flow of customers through the retail outlet is also being speeded up, by improved handling of credit-card sales.

These credit card imprinters record the amount and date of sale, along with the dealer's name and the customer's name and address—in a matter of seconds. The dealer simply inserts the credit card and sales receipt into the imprinter and pulls the imprinter handle.

Then he notes the items sold and the total cost. The customer signs it, and the credit transaction is complete.

These are the kinds of things automation has done for oil marketing up to now. What about its effect in the future?

Mechanized Station Sales

In the immediate future, introduction of more-mechanized marketing will be a slow process. The effect of new technical advances will probably be felt first in registering sales, billing, and accounting at service stations. New machines will do this work faster and more efficiently.

There are already some refinements of the new credit recorders "waiting in the wings." One pump manufacturer, for instance, is experimenting with a system that would enable an attendant to record all necessary sales information by punching code keys. (Most of today's station recorders require manual notation of information.) Such a system would be faster and more accurate than those in use today.

Some pump-makers are devoting considerable research to a system which would really "keep 'em moving" at the pump island: the pump with a built-in punch-card machine. This would deliver all the necessary sales information as the sale is concluded—without the attendant's writing or punching anything.

Advances in gasoline pumping—such as remote-control pumps, faster flow, and remote computing—are also on the way.

Pump makers for years have been saying that, under certain conditions of climate and altitude, the present "pull" system just can't supply enough lift. They contend

STATION CREDIT RECORDER is the first of a number of systems which will speed sales, step up the flow of customers.

the high vapor pressure of today's gasolines is responsible for these failures.

So they anticipate a demand for the remote systems as long as gasoline vapor pressure increases. And some predict that it will be at least five years before the gasoline vapor-pressure curve turns downward.

Another problem for pump manufacturers—increasing the speed of flow—may be solved in a few years. At present, the average service station pump can carry gasoline from storage tank to auto tank at about 15 gal. per min. Pump makers say they can increase the rate, but with one rub: The mechanical computers on such pumps start to slip when gasoline flows by them faster than the present rate.

But this computer problem will most likely be licked within a couple of years.

Remote computing is another possibility. One manufacturer is working on a system that would flash the sales data on a screen instead of having it appear on the pump itself.

The remote systems—pumping and computing—would also make possible new concepts in service station design.

As the more-automatic systems come into use, service station personnel will have to undergo a refinement.

New systems will handle many of the time-consuming "drudge" jobs that station personnel do today. New accounting devices, for instance, will probably cut at least in half the time a dealer spends on bookkeeping.

As a result, dealers and attendants will have more time to do a better job of selling TBA and other items. And, because few prospective station workers are born salesmen, suppliers will have to remold dealer-training courses, with a heavier emphasis than ever on sales knowhow and merchandising ideas.

Most marketers are reluctant to estimate how automation will effect the number of men needed to run a service station. If the fully-automatic station becomes a reality, the number of attendants per station might drop con-

AUTOMATIC ROUTING SYSTEM gives Arrow Petroleum Co., a fuel oil jobbership, centralized control of bulk plants. The system writes an order and transmits it to a plant for delivery.

siderably. But short of that, observers feel, introduction of new station equipment won't seriously affect the service station labor force.

Sales Data Processing

At this point, most major suppliers are still in the talking stage on marketing applications for elaborate processing machines.

Standard Oil Co. (Ohio), for one, is starting to use a giant electronic computer to solve some of its marketing dilemmas (PW—Mar.9'56,p26). A few other majors have just bought such computers, but are still getting acquainted with what the machines can do. Specific marketing applications are still a little while off.

But smaller computers are starting to catch on.

"Medium-size" electronic computers will probably be put to work on marketing problems in many sales offices and bulk plants during the next few years. In fact, Shell Oil Co. is already planning to install an electronic computer operation in its Pacific Northwest marketing office.

Some smaller independents are also getting interested in new marketing "systems." A few of their ideas may pay dividends.

For instance, Arrow Petroleum Co., an Illinois fuel oil jobbership, has just developed what it calls an "automatic delivery service" (picture).

Here's how Arrow's system works: Integrated data processing (IDP) is used to write an order automatically at Arrow headquarters, and, at the same time, to transmit the order to the bulk plant that will make the delivery.

The heart of the new machine system is a five-channel perforated tape, which contains all basic, constant information on each of Arrow's accounts.

The system's speed and accuracy add up to greatly improved service for Arrow's customers.

An important reason for the go-slow signal for marketing automation: high costs of the new systems.

The highly-complex, giant electronic brains—which will some day be put to use on a broad scale in solving suppliers marketing problems—cost millions of dollars.

Cost of smaller computers, the types which could be used on the divisional level, won't be prohibitive for majors. And independents too will probably be able to justify investments for such equipment.

High costs will slow down the introduction of new systems in service stations. Punch-card systems for billing and accounting at the station might run as high as $3,000 each.

A changeover in pumping equipment at stations would also prove quite costly. So pumping advances will probably continue to be introduced through new stations—where owners must make substantal investments in pumping equipment anyway.

In addition, development of pumping equipment has its own braking factor: No one knows for sure what the automobile fuel of the future will be.

The various possible fuels—super octane gasoline, propane, or gas-turbine mixtures—create different pumping problems. So the type of pumping equipment necessary for the future is also up in the air.

Automatic Stations Far in the Future

Marketing planners also talk about automatic data gathering and processing systems to feed sales information from bulk plants to district offices. And some look forward to fully mechanized service stations. But few feel that such things are possible before 1966 or 1976 at the earliest.

On the divisional sales level, the need for up-to-the-minute sales information will eventually prompt the use of elaborate data processing equipment.

Such systems could gather the latest sales figures for each product from all the bulk plants in a division, bring them together, and, in a matter of minutes, provide division marketing management with information on which to base price, inventory, and other decisions.

There is a sharp difference of opinion among marketers on whether the fully-automatic service station will ever come. But it's certainly a long-range possibility.

The customer simply would park his car in a "stall," and choose his fuel on a push-button selector. Then the machines would go to work. An automatic fuel hose (probably snorkle) would enter the car's tank opening (itself automatically retractable), deliver the fuel, and retract—all in a matter of seconds.

Meanwhile, a computer (probably electronic, but possibly mechanical), attached to the selector, would determine the amount of sale and present a punch-card bill just as the hose retracts.

Payment might be made at a toll-station exit. The customer would deposit the bill with either cash or his plastic-alloy credit card into a pneumatic tube. In just a few seconds, a receipt, and change or the credit card, would be returned through the tube.

In the long run, data gathering and processing systems—when applied to operations research—will enable marketing to play a more vital role in oil companies' over-all policy-making.

Electronic computers of the future will help marketers provide the information that top management needs—immediately, if necessary. Figures on increases and decreases in net and gross profit, costs, and prices—broken down by product, plant, branch office, and even by salesman—will figure more heavily in top-level decisions of the future.

AUTOMATION IN MANAGEMENT starts on p. 93

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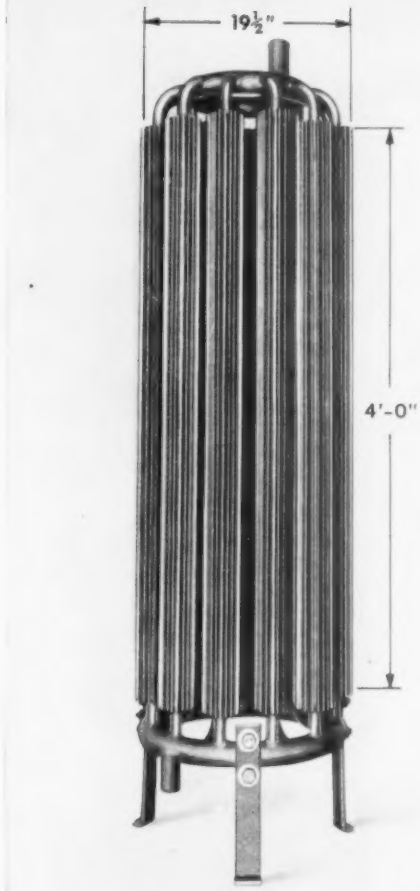
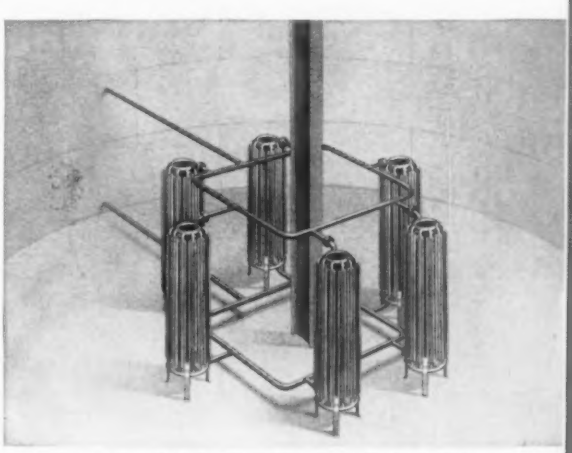


Above; View of Brown Fintube Thermo-Flo Tank Heater Showing the Legs that are Adjustable to Overcome any Unevenness of the Tank Bottom.



Six Thermo-Flo Tank Heaters Manifolded to a Single Steam Line in a Bunker C Storage Tank, Showing Bottom of the Tank Completely Open for Quick, Easy Cleaning.

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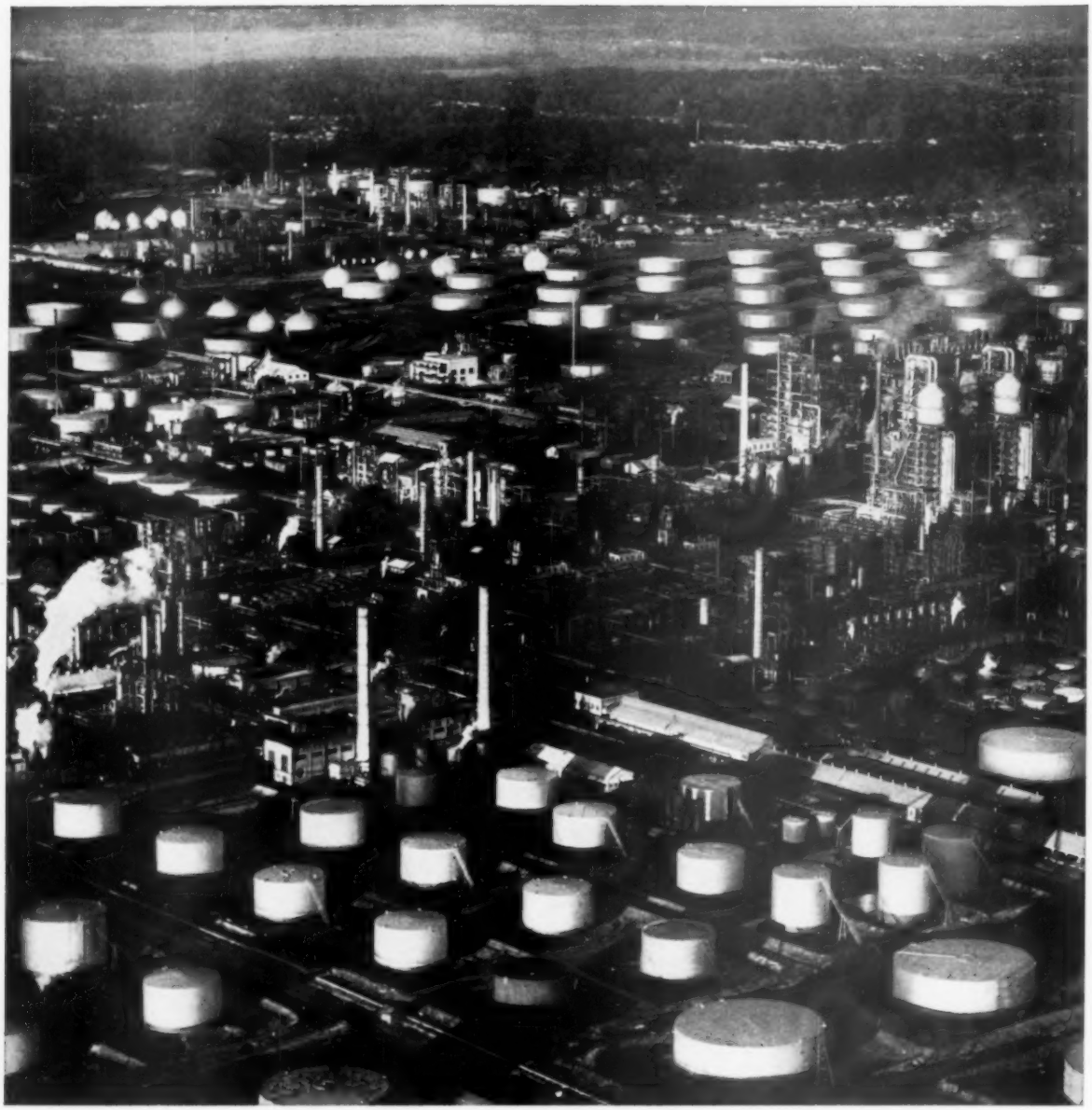

"Industry must meet the challenge of our expanding economy boldly by investing heavily in plants and equipment, by developing manpower, by devoting more time and money to research, and by improving manufacturing processes. We must also meet this challenge prudently, doing our best to avoid inflationary developments, and to soften the disruptive effects that accompany change. The success of such an effort will give the best proof possible to the world of the soundness of our capitalistic economy, and our concern for the individual, by whom and for whom American industry exists."

– M. J. Rathbone, President, Standard Oil Company (New Jersey)

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AUTOMATION IN MANAGEMENT

THE COMPUTER will analyze data for the oil manager . . .

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Coming: Better and Faster Decisions

Tomorrow's oil management will use electronic brains to improve its own judgment. But the computer won't 'take over.' And changes will be gradual.

"Automation will allow us to make decisions faster and to solve more problems," says a top oil man. Add "integrated thinking" to this and you come close to the future impact of new business machines on the management of majors and independent alike.

There is no longer any question that electronic brainpower will eventually make big changes in the job of managing a department, a district, or a whole oil company. But the important fact is that the principles of management won't change. It is only the reliance on intuition that will be reduced or eliminated. Although machines are now being asked to make routine, repetitive decisions in such fields as accounting, management by human judgment will never be replaced.

Says C. L. Hayden, head of Jersey Standard's Systems & Methods Division, "Computers will prevent some crises and avoid the need for costly remedies. They will mean closer predictions. They will produce information not available before, because it was too time-consuming to prepare the data. We will be getting better, faster, and more accurate information."

With computers, the concept of integration is taking on new meaning, far beyond the diversification of operations into each segment of the industry. More than ever before, management will be integrating the needs of various company units to seek "optimization."

In line with this is the heavy stress being placed on "integrated data processing" (IDP). This system uses a network of business machines to provide continuous-flow handling of information. Data is fed into the system at the point of origin (for example, at the desk of the clerk who receives orders for oil products). From that point on, all copying or processing of data is done automatically by a computer and connected machines.

Today, a few oil companies are in the early stages of IDP on a localized basis. But because IDP is the key to the whole concept of integrated thinking, it will be pushed hard from now on.

So will methods to give management prompt data—from the boardroom on down the line. Actually, prompt data is a byproduct of IDP and the systems analyses that precede it. In the years ahead, the average oil manager won't have to wade through a pile of reports to get last week's inventory position. He'll get up-to-the-minute figures by dialing for an automatic voice report. Or a computer will quickly locate data and type it out hundreds of times faster than secretarial help could. Or the manager will push a button to get instantaneous, televised reports. He'll be using something like IBM's experimental "Vidar," or Visual Data Readout (picture). This desktop unit is not yet in commercial production.

Today, computers are working hardest giving management faster and better data on cost accounting, customer billing, payrolls, and other office functions. But they are being used for an increasing variety of jobs.

One oil company is figuring refinery work schedules each day in only ten minutes. Another is evaluating the cost of an explosion in order to negotiate a better premium on casualty insurance.

Several companies plan to use computers to balance all the variables in bidding for contracts—to come up with "optimum" prices.

Leonard Refineries, of Alma, Mich., will use its new computer for refinery-yield analysis, warehouse inventory control, engineering problems, and payroll.

A major company officer sums up, "The ways we can use computers to earn or save money are countless."

Actually, oil management has only begun to capitalize on the computer potential. Most big oil companies and a few independents are now active in the field. Shell is an industry leader with 19 medium-sized computers—nine in

exploration and production, five in manufacturing, two in research, and one each in marketing, chemicals, and production technical services. Other majors, such as Esso Standard, Indiana Standard, Socony Mobil, and Ohio Standard have installed giant electronic brains. But, industrywide, most oil companies are either only gearing up for computer work, or still "thinking about it."

This is not surprising, since early this year only 100 computers were operating in all U.S. industry. In the next ten years, there will be few oil managements not involved.

Datamatic Corp., one of the "big machine" makers, predicts a $2-billion market for the large computers. The company believes at least 1,000 U.S. firms have sales volume and complexity of record-keeping to justify a full-blown computer system, but now "struggle along" without one. Datamatic's rule-of-thumb for these firms: A computer becomes a good buy when a company's annual gross sales are 100 times the annual cost of the electronic system.

Monthly rentals for computers today range from $500 to $40,000 or more, depending on size, speed, and capacity. Purchase prices range from $30,000 to well above $1-million. Added to this are miscellaneous costs, such as building modifications, which may run to more than $100,000. Dozens of manufacturers, particularly the big names in the business machines industry, are making computers of all sizes.

Small Companies Can Take Part

The next few years will see a flow of machines designed for the "volume market" that independents represent. Typical is the new system announced last month by Typatape, Inc., of New York, to help the small firm convert its office work to electronic data processing. The system has two units. A recorder (purchase price $900) codes on paper tape the data rung up on the conventional cash register or adding machine. A converter ($5,000) reads the tapes photoelectrically and sends the data to punch-card printer.

Experience of the past several years is proving that some form of integrated data processing is well within reach of the smaller oil company. And this could well be the key to the independent's survival in the coming "computer era."

The small company may get a lower-priced machine for its own use, or buy time at a service bureau. And the mere study of company operations in terms of new data-processing techniques, such as IDP, may prove as valuable as computer work itself. As one independent observes, "We can solve the same problems as the majors."

'Blue Sky' Thinking Is Premature

Ever since the computer arrived on the business scene, some oil men have been aware of the possibility of companywide operations control through a central computer. Talk of this has been dying down. It hasn't been forgotten, though. One oil methods analyst, who calls himself a "confirmed optimist," says, "The time has now come to think of simulating an entire company's operation by building a mathematical model. There are fantastic advances to be made by operations analysis and computers. We must keep thinking bigger and bigger."

Oil companies are finding, however, that computers can't work business magic—that management can't "optimize" its operation in five or ten years. Says Jersey Standard's Hayden: "Preconceived notions are showing signs of alteration in the field of data processing. Companies find they are saving less money than they thought they would."

"Computers will mean closer predictions. They will produce information not available before because it was too time-consuming to prepare the data."

C. L. Hayden, Jersey Standard

A major says it has been found that 70% of the savings in computer work have resulted from the accompanying methods study, rather than from the equipment.

Oil men now feel they need much more knowledge of all phases of company operations before making really big gains. Observes a top manager, "Giving an oil company a big computer is like giving a farmer an expensive tractor with a lot of new attachments. The farmer knows how to use only one or two. Similarly, the company has a lot to learn about what a computer can do."

Lack of enough theoretical and practical knowledge of how an oil business functions is the reason work toward such programs as "management by exception" is being largely side-tracked. Under this system, a credit manager might "tell" the machine he wants to see only those accounts more than 60 days past due. The system thus frees the manager from routine decisions.

Although management by exception is being used on a restricted basis in accounting and related fields, its full potential will not be reached for many years.

Company Changes Will Be Gradual

Computers will lead to some company reorganization to take advantage of new techniques. But there will be no management "shock treatment." Changes cannot successfully be made faster than the organization can absorb them.

Integrated data processing can alter existing relationships between department, and streamline the company's structure.

And a company's philosophy of organization won't change much. This is illustrated by the view of a Shell official on the apparent contradiction between the currently popular management decentralization and the centralizing effect of computer work.

Observes Matt W. Boz, assistant manager of Shell's Methods & Procedures Dept., "Decentralization is essential to the smooth operation of any big enterprise. In the operating end of business, it's here to stay.

"But in the office end you may have a different picture. In my company, all functions involving any one large plant or field office are performed at the decentralized location. Each location keeps all its own records.

"It will be fine if relatively small and reasonably priced electronic equipment can be developed to do the job we want done in each office. But there may be a decided advantage to large and higher-priced computers. And decentralization for some companies will not be harmed if we consider central data processing centers for volume clerical functions."

AUTOMATION AND PEOPLE starts on p. 97

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Glenn Forgan, Division I

banker in a Christmas tree

It might seem strange to find a banker in a "Christmas tree" (the above-ground equipment which controls oil production at the well). For Glenn Forgan, of The First National Bank of Chicago, it's routine. Since 1933, the tall man with the broad smile has been a familiar figure to oil men all over the nation.

Glenn Forgan heads Division I, which finances oil and gas producers. Of his 37 years at our bank, 20 have been devoted to this industry. During this period, Division I has loaned more than a billion dollars to drill, produce, refine, transport, and market oil and gas.

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The First National Bank of Chicago

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MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

People Will Become More Important

Work with new machines will require higher skills from both manager and worker. But jobs will be plentiful and more rewarding, and there will be time to adjust.

Automation will be an evolution, rather than a revolution, in the lives of people in the oil industry. Although big changes are coming, they will be made in much the same way that technological advances have come in the past.

What has happened is that the equipment and methods specialists have looked many years into the future at the great advances that automation can potentially bring. But the oil man at the well site or at the district office has been busy on today's problems. It's not hard for him to get the impression that some people are trying to remake the industry with electronics overnight.

Actually, the specialists are the first to realize that it will be many years before their planning can be applied, even in part. However, although there will be no disruption of the oil business, automation will bring changes in work for employees of both majors and independents, in all parts of the industry. In the next 30 years, managers and workers alike will see the approach to their jobs gradually shift.

The Manager of Tomorrow

The most successful manager in the future will be the man who can bridge the gap between technology and people. He will have to think broadly—across the industry, and over the years ahead. As one oil executive says, "The next 30 years will separate the men from the boys. The new leader will be the hybrid scientist-manager, who understands automation and can apply it. In the future, we'll have to take longer, more-calculated risks. We'll have to be better informed than we are today. And above all, we'll have to build an integrated team of people."

"There will be a great change away from the driving leader who gives flat orders, to the leader who will work through people," an employee relations chief says. "This trend is already well under way," he adds, "and it will continue as the oil business becomes more complex. No longer will one man be able to do the job alone."

"Many veterans in this business," an oil manager observes, "are proud of the job they have done without electronics. And they have done remarkably well. But often they have been so busy grinding out the day's work that they haven't had time to put their feet on the desk to think about long-range improvements or what their people are thinking. By freeing men from routine, repetitive decision-making, automation will allow them to become true planners and supervisors of their people."

But ability to handle people won't be enough. Technical background will be at a new premium. Says one of the industry's top personnel men, "The plant manager of the future is going to have to be a highly trained technical and industrial relations expert.

"In the past, a man was promoted because he could get along with others. He was a leader, although he may not have been a technical man. But that's changing. The time of the roughneck moving up to head a big plant or a company is probably gone forever."

But today's "natural businessman," who knows how to make decisions, will actually be in greater demand than ever. A major company official says, "Data will be arriving on the manager's desk in new forms. He will have to change his analysis thinking and admit, 'I can read this thing across as well as up and down.' But mainly, automation will allow the manager to apply his talents better—it won't replace them. As machines come into wider use by management, the intangibles will become more important. It's with intangibles, such as public relations, that a telephone call to the right department head can be worth a lot of electronics."

The main change in the work day of the average manager will be that he will find on his desk more data, better data, fresher data, and data not available before. He will be able to do more work with the same amount of effort.

Better Jobs for Employees

Automation will not mean unemployment in the oil industry. It will mean more employment, as it creates new jobs for those it replaces. For example, a major company accounting department that installed a computer shifted 14 employees to new work. No one was dismissed.

In field operations, such shifting is often not possible, since workers lack the skills for new work. In such cases, most oil companies are (1) keeping people on until company expansion creates new openings, and (2) allowing normal turnover to solve the problem.

Automation will mean less menial and routine work for oil employees. It is repetitive, unrewarding work that automatic machines of all kinds are designed to handle. This

AUTOMATION AND PEOPLE

"We do not object to automation. When more work is done by machines and instruments, the burden of labor to be carried by man is lessened."

O. A. KNIGHT, Oil, Chemical & Atomic Workers Union

will mean that workers in all parts of the industry will be "upgraded" into jobs that allow more freedom for imagination and initiative.

Labor Union Approval

Leaders of oil unions generally approve of automation—as long as the workers' interests are protected. Says O. A. Knight, president of the Oil, Chemical & Atomic Workers Union, the largest oil union: "We do not object to automation. When more work is done by machines and instruments, the burden of labor to be carried by man is lessened. But there should be a minimum of dislocation or displacement of men.

Knight continues, "Automation will be self-destroying if it produces benefits only for the owners. Wages in recent years have not kept up with productivity."

Oil union men feel that in too many plants there are beginning to be more supervisory Chiefs than Indians. An OCAW analysis shows that the industry's hourly-paid payrolls are declining, while supervisory and technical payrolls are increasing.

OCAW believes that, when there are too many supervisors, they are used to do the work of hourly-paid men. The union's view: It's not good to have a man supervising a job and doing it at the same time.

Says an OCAW spokesman, "Our consolation is that the point is rapidly being approached at which the supervisors and technicians are so numerous that, instead of being the 'company elite,' they will become 'worker minded.' Will we reach the ridiculous stage at which the supervisors make up the large force that can strike a company?"

The OCAW official doubts that automation will lower union strength. He says that, "as equipment grows more complex, it becomes more vulnerable to the withholding of labor—it becomes harder for the employer to replace experienced operators and maintenance men."

Needed: Training in Automation

One of management's biggest problems in automation is that equipment advances are being made faster than people can use them. The shortage of technical skill at all levels is hurting. Says one oil company computer specialist, "The demand for personnel in this mechanization is four or five times greater than the supply."

Adds another, "The need is not only quantitative; it is also qualitative. The man with some gadgeteering skill will no longer do. Even in average jobs, automation will require a trained imagination, good judgment, and some skill in logical methods."

Still another oil manager points out that the nation is short roughly 25,000 new engineers a year, and adds, "The scramble is on. Some companies are losing good people. It's time to take a new look at the salary scales."

One result of this situation is that oil companies will be continuing their joint efforts with other industries to aid college teaching of scientific subjects. There is now growing attention in colleges to training in electronic data-processing and operations analysis. "In fact," says a management analyst, "it's not too soon for high schools to start training students in these subjects."

Oil companies are also realizing the need for top-to-bottom "education in automation" for people already on the payroll. Says an oil man whose company has a "head start" in electronics, "The cost of training people to use new equipment far outweighs the hardware cost." As a beginning, the company has set up computer training classes ranging from two-hour sessions to five-week intensive courses. Attending these are many of the company's key managers and technical people.

A big reason why Shell Oil Co. has scattered 19 medium-sized computers throughout its operations (rather than investing in one or two giant brains) is its desire to lay a broad foundation of electronics knowhow.

Matching the value of skills being developed is the importance of education in automation as a means of winning employee acceptance. There is general awareness of a potential morale problem in the mind of top management.

Most of the resistance comes from employees—whether managers or workers—who are worried about job security. "You can't blame a man," says an oil personnel chief, "for wondering if he's going to be replaced by a bunch of vacuum tubes." The companies are meeting the problem by explaining changes carefully and by introducing them slowly.

Concludes an oil manager in the Southwest, "Many people simply don't like change for any reason. But we've always had change in the oil business, and we always will. We can't expect to avoid all protests. But when people receive training, and when they are told frankly what the company is doing and why, most of them accept changes willingly. It helps to have them take part in working out new systems.

"It's encouraging to us to find that most of our people are anxious to learn and to try something new."

Reprints Available

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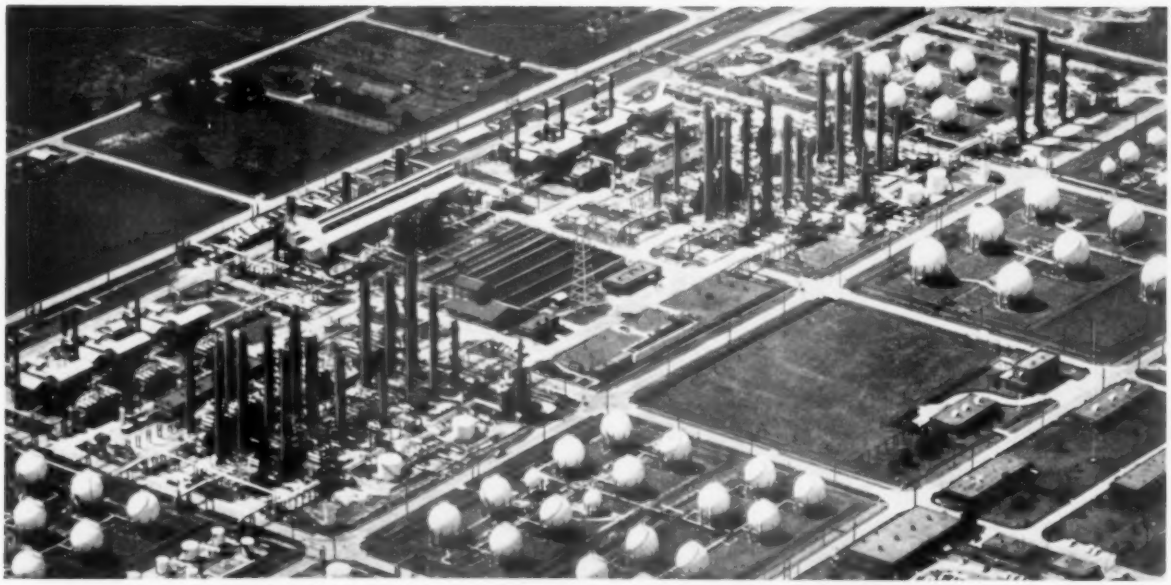

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The present capacity of this plant, the largest in the world for the production of Butadiene, will be increased from 200,000 tons/year to 300,000 tons/year.

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API Hears Broad Transport Views

There may be too much competition in petroleum transportation, there is certainly too much taxation, but there is not enough broad knowledge, API's Transportation Division was told this week.

These views were presented by the three principal speakers at the division's annual meeting in Chicago.

Here, in brief, are summaries of the three views:

TAA's George P. Baker . . .

Hits Unfair Taxes

The transportation industry is "married" to the petroleum industry —each being the best customer of the other, says George P. Baker, president of the Transportation Assn. of America.

More than half of the petroleum industry's domestic output is consumed "by one form of transport or another," he says. "On the other hand . . . almost one-fourth of all intercity freight traffic is petroleum."

Domestically, motor carriers handle "well over 30% of the movement of refined products," he says. Pipelines account for "nearly 16% of the nation's total intercity freight traffic on a ton-mile basis . . . over a third of the waterway traffic is petroleum of one form or another . . . liquid bulk movement of petroleum represents 80% of our total coastwise waterborne tonnage . . . and railroads handle 5% of the total petroleum traffic."

Both the petroleum and transportation industries, therefore, have common interests in U.S. excise and motor fuel taxes, says Baker.

Pipelines pay well over $15-million annually to the U.S. for-hire barges, tank trucks, and tank cars pay at least an additional $15-million in taxes on their transportation charges. And these taxes show up in the cost of such transportation facilities to oil shippers.

At the same time, motor carriers and aircraft operators are paying a heavy share of the $1-billion-plus in gasoline and diesel fuel taxes that the U.S. is expected to report for fiscal 1956. (Similar state levies may amount to $2.7-billion.)

Also, motor carriers will be paying a further share of the government's new $33-billion highway-expansion program in the form of tire taxes and via a $1.50-per-1,000-lb. levy on trucks weighing more than 25,000 lb.

Both the excise and motor fuel tax programs, however, contain unfair applications to transporters. And oil men should be more objective about these complaints, says Baker.

Pipelines pay a rate of 4½% of their revenues to the U.S. And shippers using for-hire barges, tank trucks, or tank cars, must pay a general tax rate on freight of 3%.

There are no excise taxes on the large fleets of tankers and barges that are operated by the oil companies themselves. The tax doesn't apply to private carriers. This tends to deprive the common carriers of some of the traffic they might be able to obtain if they only had to compete with private carriers on a cost basis, says Baker.

The Transportation Assn. doesn't advocate an excise tax on private carriers; it wants the common carriers untaxed.

As for motor fuel taxes, the transportation industry considers these as rightful "user charges" for government-built facilities, says Baker.

There's general oil industry reluctance to accept such taxes. But TAA, while it may object to specific applications of fuel taxes from time to time, endorses the general principle.

The rub is that users of the federally-maintained waterways pay neither tolls nor fuel taxes. TAA favors a gradual setting up of some system that would charge waterways improvements to users.

"Being major beneficiaries of specific exemptions from transportation regulation," says Baker, "the oil industry should continue to examine objectively the complaints of regulated carriers about their competitive disadvantages."

EDUCATOR Franklin M. Kreml . . .

Plugs Transport Teaching

There is a "fairly critical" need in both government and industry for transportation "generalists," as opposed to specialists, says Franklin M. Kreml.

Kreml is director of the new Transportation Center that opened last month at Northwestern University, Evanston, Ill. (PW—Aug.24'56,p21).

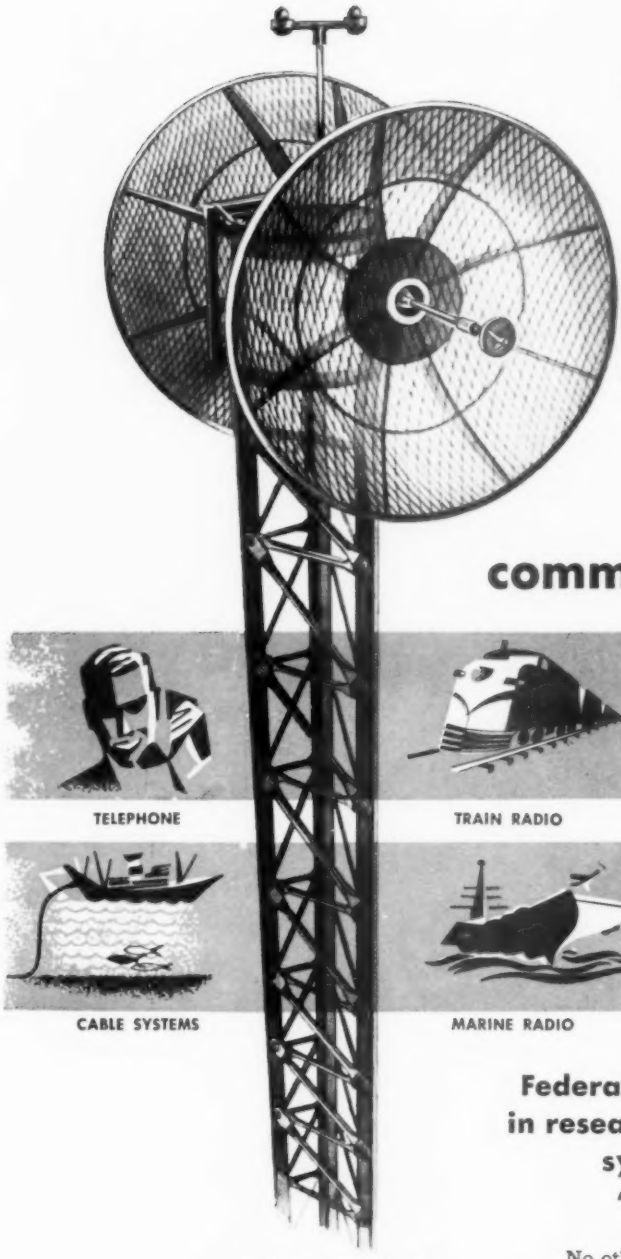
Transportation companies, he says, will always need engineers, accountants, and other specialists.

Also, there will be continued need for the professionals who specialize in transportation—highway engineers, pipeline engineers, etc.

But all of these professionals are schooled in transportation only to the extent that such schooling fits their specialties.

"Transportation, as such, has never really been an acadamic discipline or a profession in itself," says Kreml.

The new Center hopes to fill this vacuum by drawing together the transportation applications in each profession and creating an integrated approach to the whole field. In addition to offering undergraduate and graduate curriculums including trans-



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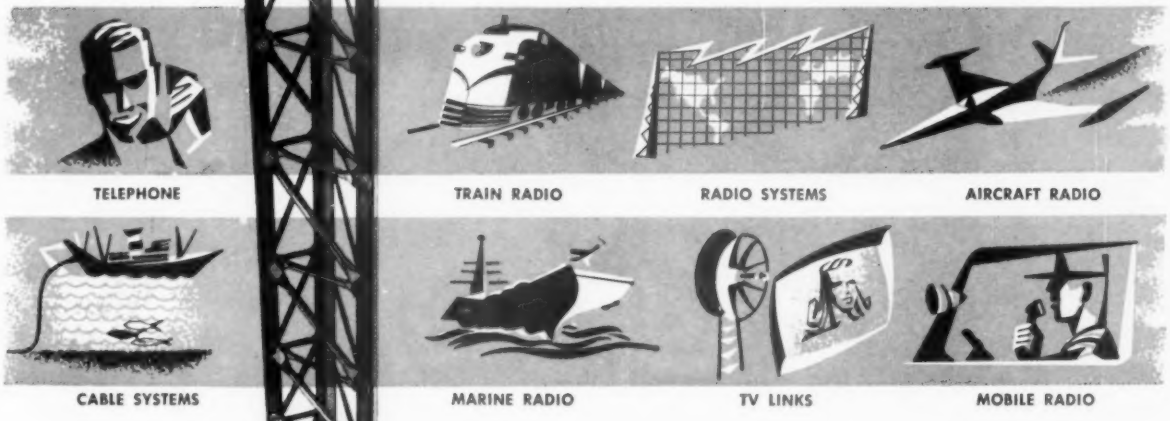

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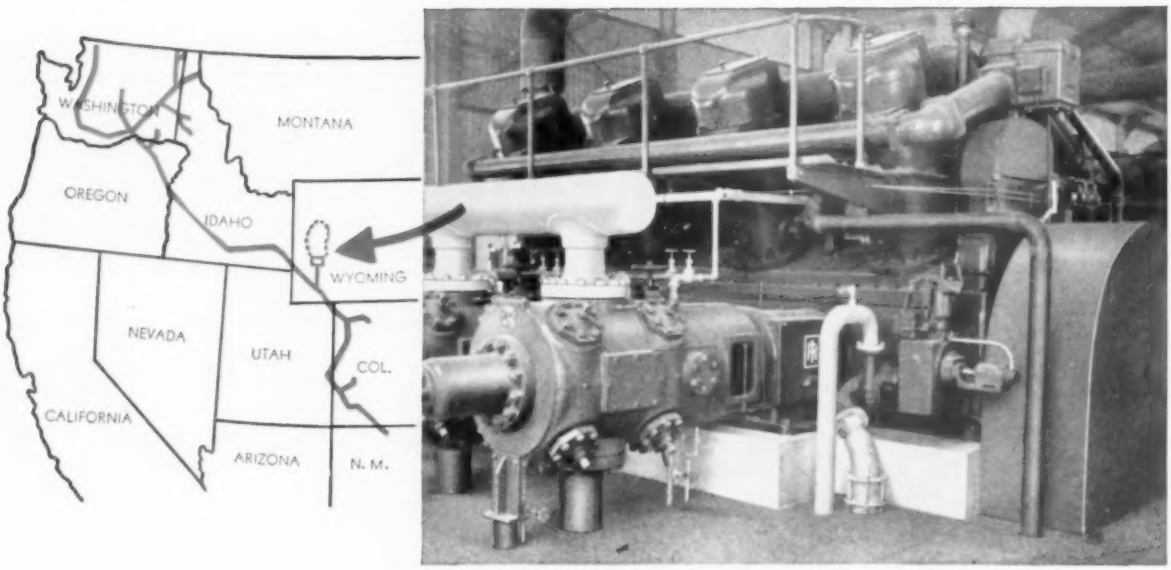

One of seven KVG Gas-Engine Compressors at Big Piney Station of Pacific Northwest Pipeline.

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The Big Piney Station of the new Pacific Northwest Pipeline system is of special interest for two reasons.

Located at an elevation of 7,325 ft above sea level, it is the highest pipeline compressor station in the country—operating in temperatures ranging down to 40° below zero.

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Hence it was quite appropriate that opening ceremonies for the Pacific Northwest Pipeline were held at Big Piney—where seven Ingersoll-Rand KVG Gas-Engine Compressors boost field gas to pipeline pressures. Two 880-hp units and two 660-hp units operate with intake pressures of 100-350 psi and discharge pressures of 400 to 550 psi. Three more 660-hp units have intake from 400 to 550 psi and discharge pressures of 650 to 850 psi.

Because of the extremely high altitude, the gas engines were supplied in bigger-than-normal sizes. Combined rated horsepower of the seven Big Piney units would be 5,060 hp at normal 1,000 ft altitude—for an actual load of about 3,885 hp under average conditions. The station is completely "winterized" for dependable operation at sub-zero temperatures.

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portation, as such, the center will offer "in service" courses to those already in transportation jobs, plus research and consultative services to industry.

The "generalists" would be men who understand "the interrelationship between various modes of transport, and the balancing of economic desirability against engineering feasibility."

Such men are needed, says Kreml, not only in the top and near-top echelons of the private transportation industry, but also in the military field and in the various governmental agencies which deal with transportation at a policy level.

"Something other than political pressure should be brought to bear on policies regarding regulation and the fixing of rates, routes, and service," he says.

ICC's Howard Freas says . . .

Competition Study Needed

There's no question that the American transportation system is a good one—and intensely competitive, says Howard Freas, Interstate Commerce Commissioner. "More goods are transported more miles, usually in less time, and at relatively lower cost, than in any other country."

And at least two classes of carriers are struggling for each portion of available traffic, he says.

The trouble is, he says, that it may be too competitive. Most carriers do not know their precise costs. So "many of them accept and solicit traffic which they cannot handle economically and establish rates which are not compensatory." The results:

Rate wars; carriers getting traffic that might be handled more efficiently

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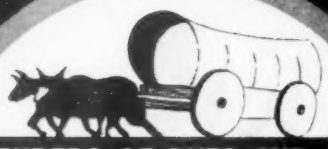

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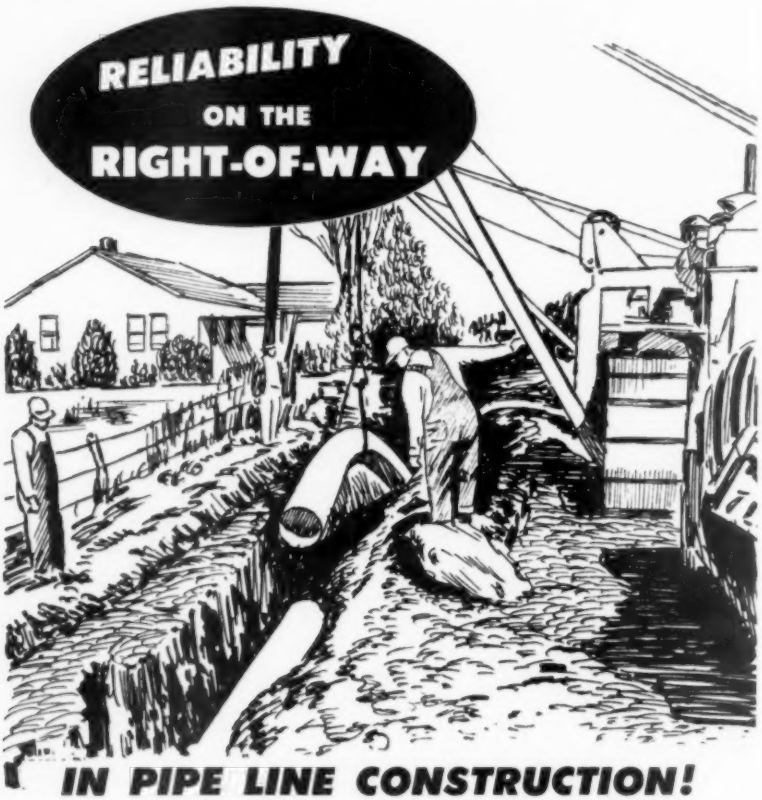
by other modes of transportation; shippers encouraging such inefficiency for "illusionary" short-term benefits; overabundance of facilities; and increased costs as a result of unused capacity, causing high rates which the public must absorb.

All forms of transportation should jointly finance a study of intercarrier conflicts, or find a foundation that would tackle the job, Freas says. He doesn't advocate formation of a single, all-carrier policy-making company, nor the parceling out of traffic arbitrarily to particular types of carriers.

But "the time has come for team play between the various modes of transporation," he feels.

As a start, he suggests the industry examine its own inefficiencies and estimate possible savings. But he warns that the study should be headed by no one group, lest it be branded a "railroad report" or a "pipelines report," for example. Nor would a survey by a government regulatory body do, he says, because it would also be subject to criticism.

As for having a foundation undertake the project, he says, "I know of few endeavors which would benefit the general public more."



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What's New
IN TRANSPORTATION

Tanker loadings at Sarawak, Borneo, are being controlled from the tankers themselves. A $28,000 portable transmitter-receiver, developed jointly by Royal Dutch Shell and General Electric Co., Ltd., it taken aboard tankers at Shell's offshore moorings. It gives radiophone service to shore. But a "pump control" channel overrides the phone channel, permitting quick shutdowns of shore pumps.

•

Trans Mountain Oil Pipe Line Co., Vancouver, B.C., wants to boost capacity of its system to 300,000 b/d. The company pipes crude from Alberta to the Pacific, including deliveries to the State of Washington. Present capacity of the system is 184,000 b/d, but pumping stations already under construction will hike this to 200,000 b/d by mid-1957.

•

American Oil Co. has decided to "jumboize" another tanker—the fourth of Amoco's 16-ship fleet to be enlarged in this fashion (PW—Jun. 15'56,p47).

First of the four tankers to be remodeled—the Amoco Delaware—will hit the waves next Apr. 8. Amoco's jumboizing program, which adds about 4,000 tons to a T-2s capacity, is now projected to October, 1958. Newport News Shipbuilding & Drydock Co. has contracted to remodel the four ships.

•

Houston Natural Gas Corp. has completed its purchase of Houston Pipe Line Co. The 1,170-mi. system was bought from Atlantic Refining Co. for $38-million.

Houston Pipe Line has been part of Atlantic's $200-million purchase of certain Houston Oil Co. properties earlier this year (PW—Jun.15'56,p10).

•

El Paso Natural Gas Co. is adding a 170-mi. microwave radio relay link to its communications network. The new link will extend El Paso's microwave network to approximately 1,000-mi.

This installation, third for El Paso, connects the company's branch offices at Flagstaff, Ariz., and Gallup, N.M. Radio Corp. of America has the contract.

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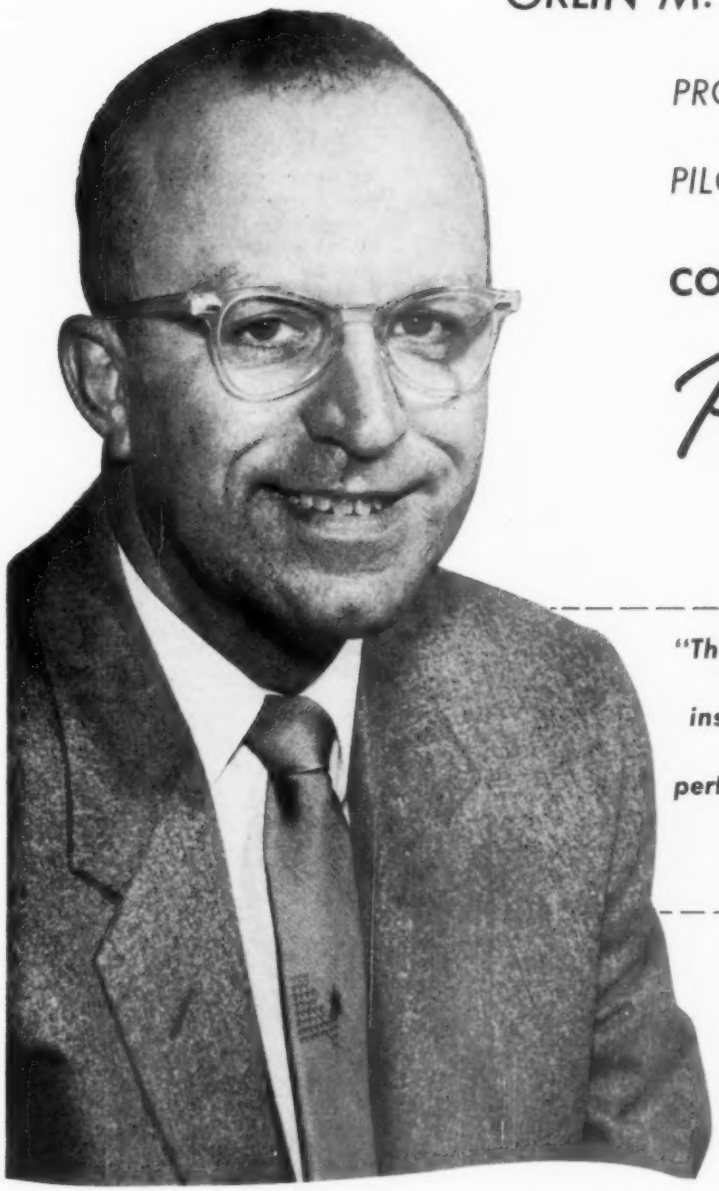

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DEPT/Refining

Processing of Field Gasoline Grows

More natural gasoline producers appear about ready to become refiners of high-octane finished gasoline. And they may also become manufacturers of hydrocarbon raw materials for chemical processors.

It's going to be an expensive move to install the necessary processing equipment at natural gasoline plants. But many producers feel that entering manufacturing operations is a necessary step to reverse the declining value of natural gasoline.

Last week the price for grade 26-70 natural gasoline in the Mid-Continent dropped to 4.5¢ a gal., off ½¢ a gal. A year ago, the price was 6¢ a gal. (Surprisingly, too, last week's price cut was a contraseasonal trend. Normally, prices are higher in the fall and winter months, when refiners use more natural gasoline to blend with their refined gasoline.)

Natural gasoline producers are faced with a strange paradox: There is a strong demand for their product from refiners. But there is a definite price ceiling, based on the value of natural gasoline to refiners.

And as a blending component in finished gasoline, natural gasoline is becoming extremely limited. The reason is that the low-octane natural gasoline—like straight-run refinery gasoline—has been left behind in the octane race.

Natural gasoline is still valuable as a blending component to maintain volatility balance in finished gasoline. But the real value to refiners pretty much ends there.

Demand for natural gasoline and other field cycle products by refiners is good, though. It is averaging about 375,000 b/d, up 5% from last year.

Catalytic reforming and isomerization of field natural gasoline is being tried by a few producers, and is being considered by a larger number, as ways to upgrade the value of their raw material.

Three natural gasoline producers—Arkansas Fuel Oil Corp. (at Carthage, Tex.), Southwest Gas Producing Co. (at Dubach, La.), and Texas Natural Gas Corp. (at Winnie, Tex.) already have reformers on stream (PW—Aug.3'56,p28).

This week PETROLEUM WEEK learned that a group of Texas natural gasoline producers are working on plans to build a joint processing facility for making high-octane gasoline. The group is understood to be considering a refinery that would have fractionation and isomerization units, and possibly a catalytic reformer.

The purpose of a joint operation is to provide enough volume of natural gasoline charge stock from several gasoline plants to make the economics of large-scale refining more attractive. Also, of course, the joint operation would spread out the high investment needed for the processing units.

The decline in value of natural gasoline and cycle products fractions is prompting refiners also to use these raw materials as economical cat reformer feeds.

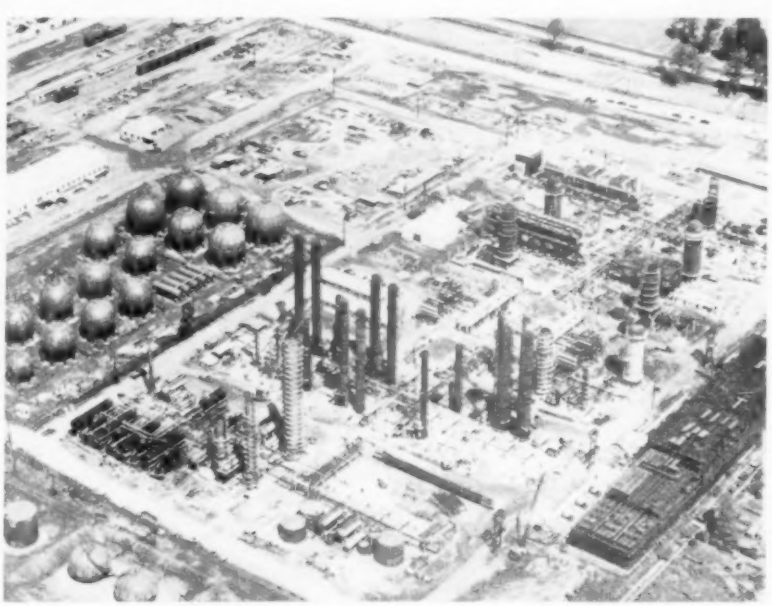
Famariss Oil & Refining Co., at Monument, N. M., for example, now uses a feedstock composed of 60% gas well condensate and 40% straight-run gasoline for its Platformer-Unifining unit.

And it appears that a larger number of refiners will be using natural gasoline fractions in their desire to obtain more cat reformer feedstocks for conversion to high-octane blending components.

Cat reforming of natural gasoline can boost octane value from the "straight-run" level to at least the level of "regular" grade motor fuel. Isomerizing pentane and hexane fractions can make 100-plus octane components for top premium gasolines.

Southwest Gas could make an 82.5-octane material (with 3 cc. of tetraethyl lead) from its straight-run natural gasoline. But with the addition of a 2,000 b/d reformer, the company makes a motor fuel fraction that can be blended into two grades: 40% of 95-plus octane material and 60% of 88-octane, for a pool octane of 91-plus. The average TEL content is 2.25 cc.

Normal pentane, with an octane blending value of 62 (research, clear) can be isomerized to give a blending value of 92 unleaded. Isohexanes, with butane or pentane enrichment, have blending values in the 80-90 research octane range. Normal hexanes found



Industry Eyes New Butadiene Plant

The industry has its eye on Texas Butadiene & Chemical Corp.'s new butadiene plant at Channelview, Tex., near Houston. The reason: It may be a key to the economics of alkylation-vs.-butadiene use of butanes (PW—Mar.23'56,p50).

Production capacity will be 65,000 tons per year of butadiene and 6,800 b/d of aviation gasoline. The plant is scheduled to go on stream early in 1957. An underground well at Mont Belvieu, about 14 mi. away, will be used to store more than 1-million bbl. of raw materials as feedstock for the plant.

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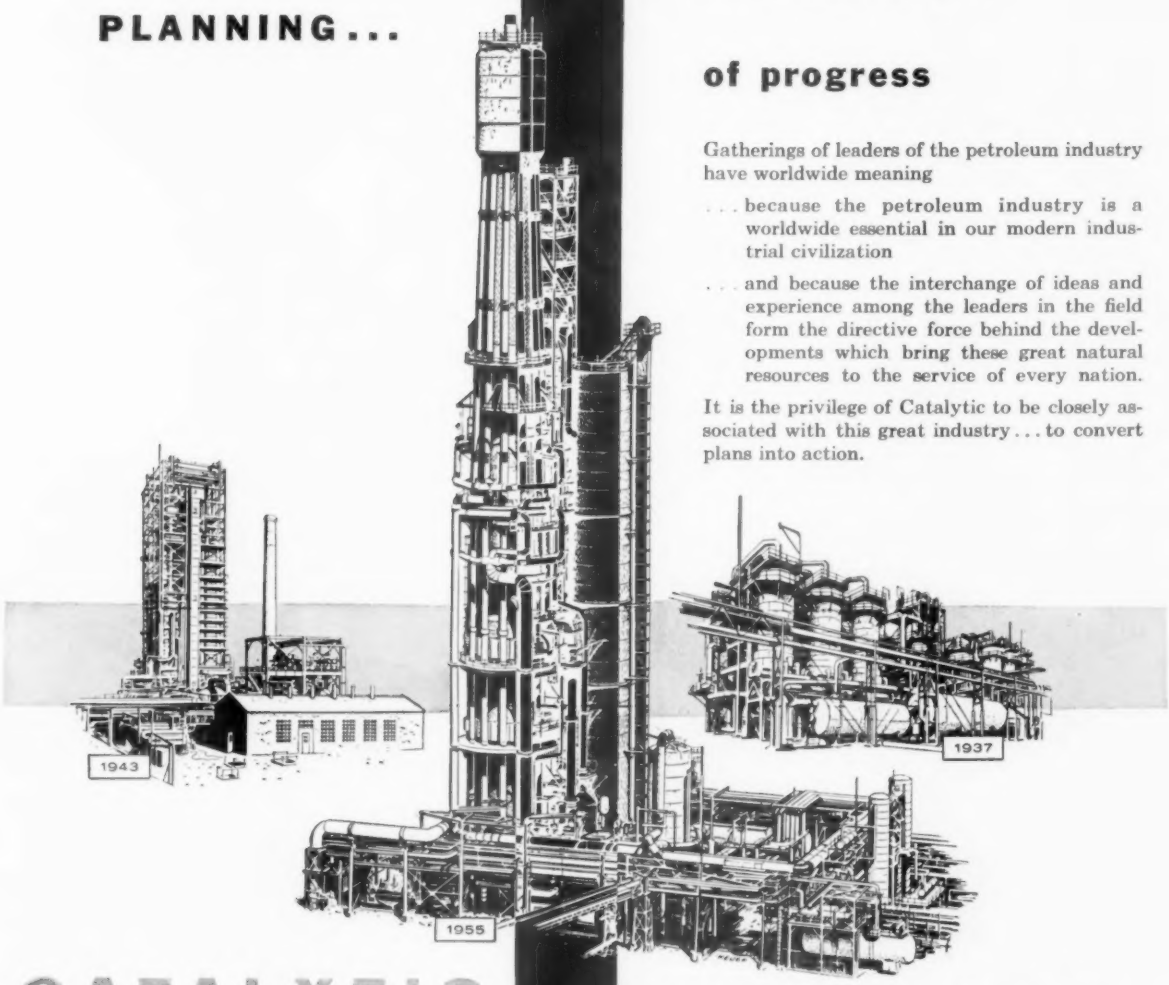
. . . and because the interchange of ideas and experience among the leaders in the field form the directive force behind the developments which bring these great natural resources to the service of every nation.

It is the privilege of Catalytic to be closely associated with this great industry . . . to convert plans into action.



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NEW "Unionmelt" Welding Assemblies

for greater job versatility- performance dependability

Versatility and dependability are yours at an all time high in an improved new line of UNIONMELT welding assemblies . . . These units embody the greatest variety of machine combinations, job applications, and design features ever offered for submerged arc welding.

Wire feed units are simply constructed and are highly efficient . . . Identical mounting dimensions for heads, brackets, and slides allow for any number of desired assembly combinations.

Welding heads have exceptional flexibility because of sturdy new mounting fixtures which provide for vertical, horizontal, and rotary adjustment. Stationary and self-propelled combinations are also available.

The wide variety of standard and custom UNIONMELT welding assemblies can easily be made to fit your particular applications—at costs lower than many current standard models.

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in natural gasoline have octane blending values of around 25.

Doubts over a satisfactory payout, though, is holding back a big swing to refining natural gasoline in field plants. The economics of building refining units depends, of course, on the value of the upgraded product. The pressure on gasoline prices has been heavy so far this year.

But a big boost in demand for domestic crude by European buyers could bring a greater demand for available raw materials for making finished gasolines. This, of course, would provide a greater incentive for up-grading the low-octane field gasoline.

What's New / IN REFINING

Catalytic Units Require New Approach to Safety

Petroleum processors must develop new safeguards to prevent explosive mixtures in modern process units that require the presence of all three elements of the "fire triangle" to carry out chemical reactions.

This plea was made at the API annual meeting this week by J. C. Ducommun, general manager of manufacturing for Standard Oil Co. (Ind.)

Ducommun based his comments on the lessons learned by the company following the explosion in a hydroformer at its Whiting (Ind.) plant in August, 1955 (PW—Sep.2'55,p22).

In regenerative catalytic processes, such as the one lost at Whiting, "dangerous" mixtures of process-gas and air are possible in the presence of hydrocarbon streams and sufficient temperatures to cause ignition, according to Ducommun.

The potential "explosive range" in catalytic units, he said, is increased "some tenfold" because of the presence of hydrogen.

The conventional approach, of designing stronger equipment with pressure-relieving devices, will not provide proper and necessary safeguards, he said.

Ducommun recommended that additional oxygen analyzers must be supplied to provide better control of oxygen supply. Also, inert gas holders, dependable motor-operated double block valves, and seal-gas systems are needed to assure a separation of the fuel and oxygen sides of the first triangle in process units.

•

D-X Sunray Oil Co. has awarded a $10-million contract to Refinery Engineering Co. for the construction of six major process units at two Oklahoma refineries.

Five of the units will be built at the company's 70,000 b/d West Tulsa refinery. They are a 20,000 b/d naphtha Unifiner, a 12,000 b/d Platformer with rerun column, a 2,470 b/d hydroflouric acid alkylation unit, a 2,453 b/d butane isomerization unit, and a 1,417 b/d liquefied gas recovery unit.

A 6,000 b/d naphtha Unifiner will be added to the 40,000 b/d Duncan refinery.

Completion of all units is planned for the last quarter of 1957.

•

Australia is considering its second plant to make liquid hydrocarbon fuels from solids.

The newest plant would be a low-temperature coal carbonization plant. The project would be built in three stages.

The first would be a carbonization plant to produce char, gas, light oil (for heating), and tar. The second stage would be a chemical producer, making acetylene, methanol, ammonia, rubber, and nitric acid. Finally a unit to produce plastics and other synthetic fibres is planned.

Australia's first liquid-fuel-from-solids plant, a lignite gasification facility (PW—Jul.27'56,p30), went on stream last month.

•

Lion Oil Co. has started construction of a nitric acid concentrator at its El Dorado (Ark.) chemical plant.

The new plant, being built by Chemical & Industrial Construction Corp., is designed to produce 40 tons daily of nitric acid of 95% strength from a 58% nitric acid raw material.

•

U.S. Oil & Refining Co.'s 8,000 b/d refinery at Tacoma, Wash., is now scheduled to be on stream by next May or June, according to John E. Ford, Jr., board chairman.

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A COMPLETE REFRACTORIES SERVICE...

for the Petroleum Industry

LITECAST 50—
A hydraulic-setting insulating castable refractory material, having a density of approximately 50 lbs. per cubic foot. Its extreme light weight and exceptionally low thermal conductivity make it an efficient and economical heat insulator. Recommended for vessel linings and backing for brickwork for other heavier castable refractory materials.

HIGH-STRENGTH BRIK-CAST—
A hydraulic-setting castable refractory material unique in that it contains more bonding agent, which results in a product more resistant to the physical actions of impact, erosion, and load bearing. Used extensively for lining regenerator chambers and catalyst lines in catalytic cracking units.

LITE-CAST 50-M—
A 50-pound density insulating castable, having a high degree of purity, used as a liner in vessels and lines where atmospheres must be controlled, or contamination of internals must be avoided. LITECAST 50-M may be applied in the same manner as standard hydraulic-setting castables.

BRIK-CAST 3000—
A hydraulic-setting castable refractory material, composed of clays and bonding agents having the highest purity, resulting in a product with a high operating temperature (3000° F.), and resistance to reducing atmosphere in carbon monoxide attack. Recommended for sulphur burner chambers and other vessels operating above normal cracking and reforming temperatures.

GENERAL REFRACTORIES CO.
Philadelphia 2, Pa.

The Market Place AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All Prices as of November 12

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U. S. Gulf Coast, Cargoes
- Gasoline, 98 oct prem. 13.25-13.75
- Gasoline, 92 oct reg. 11.25-12
- **Kerosine 9.5-10†**
- Heating oil, No. 2 9-9.5
- Gas oil, 48-52 d.i. 9.125-9.375
- **Fuel oil, bunker "C" $2.15†-2.60†**

Carribean, cargoes
- Avgas, Grade 100/130 16.75
- Gasoline, 93 oct research prem. 11.5
- Gasoline, 87 oct research reg. 10
- Gasoline, 79 oct research 9.125
- Gasoline, 70-72 oct motor method 8.875
- Kerosine 9.5
- **Heating oil, No. 2 9†**
- **Gas oil, 48-52 d.i. 9.125†**
- Fuel oil, bunker "C" $2.10-2.15

New York Harbor, barges
- Kerosine 11.25
- Heating oil, No. 2 10.65
- Fuel oil, No. 6 $2.80

Okla.-Group 3, northern, shpt, bulk
- Gasoline, 88 oct reg. 11.5-11.75
- Kerosine 10-10.25
- Heating oil, No. 2 8.875-9.5
- Fuel oil, No. 6 $2.00-2.20

Chicago, bulk
- Gasoline, 91 oct reg. 12.75
- **Heating oil, No. 2 10.25†-11.1†**
- Fuel oil, No. 6 high sulfur 7.7-8.05

Los Angeles, rack
- **Gasoline, 84 oct reg. 12.4†-12.9**
- Diesel fuel, PS 200 9-9.8
- Light fuel, PS 300 $2.65
- Heavy fuel, PS 400 $2.15-2.25

Natural Gasoline, Grade 26-70
- FOB Group 3 4.5-5
- FOB Breckenridge, Tex. 4

LP-Gas—Propane
- Oklahoma (Group 3) 5

Penna Lubes
- Bright stock, 25 p. t. 27
- 200 vis. neutral, 25 p.t. 25

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent 95 v.i. 24-25
- Neutral, solvent 200-210 vis. 19.75-20.75

Gulf Coast Lubes
- Bright stock solvent, 95 v.i. 25
- Neutral, solvent, 200 vis. 21.5

Eastern Hemisphere

Singapore, cargoes
- Avgas, Grade 100/130 18.375
- Gasoline, 79 oct research 10.125
- Kerosine 10.5
- Gas oil, 48 d.i. minimum 10
- Fuel oil, light $3.45

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, 36.0-36.9 $2.82
- North Dakota, 36.0-36.9 2.82
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9 3.05
  - Gulf Coast, upper and lower, 26.0-26.9 2.82
  - West Texas sweet, 36.0-36.9 2.82
  - West Texas-New Mexico intermediate 36.0-36.9 2.75
  - West Texas-New Mexico sour, 32.0-32.9 2.61
  - East Texas flat price 2.90
  - Mirando, 28.0-28.9 3.11
- Illinois Basin flat price 2.90
- Pennsylvania Grade, Bradford dist. flat price 4.68
- California, Signal Hill, 21.0-21.9 2.41†
- North Louisiana-Arkansas, 36.0-36.9 2.82
- Wyoming sweet, 36.0-36.9 2.75
- Wyoming sour, 32.0-32.9 2.48

Canada (flat prices, at the well)
- Acheson-Stony Plain (Alta.) D-2, D-3, L.C. 2.54
- Leduc-Woodbend (Alta.) D-2, D-3 2.60
- Redwater (Alta.) D-3 2.49
- Daily-Mississippian (Man.) 2.34
- Smiley-Viking (Sask.) 2.26

Venezuela (Cargoes, FOB lifting port designated)
- Cumarebo, 48.0-48.9, Tucupido 3.40
- San Joaquin, 41.0-41.9, Puerto la Cruz 3.04
- Oficina, 35.0-35.9, Puerto la Cruz 2.80
- Tia Juana Medium, 26.5-26.9, Amuay 2.30*
- Bachaquero, 16.5-16.9, Amuay, Las Piedras 1.90**
- Tarra, 38.0-38.9, Cardon 2.91
- Lagunillas Heavy, Amuay, Cardon, Las Piedras, flat price 2.05

Differential per ½ deg. grav.: (*) 2.5¢ bbl. (**) 3.5¢ bbl.
†Differential per deg. of grav. varies.

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabian, 36.0-36.9, Ras Tanura 1.97
- Basrah, 32.0-32.9, Fao 1.79
- Iranian, 34.0-34.9, Bandar Mashur 1.91
- Iranian, 34.0-34.9, Abadan 1.86
- Iraq, 36.0-36.9, Fao 1.87
- Kuwait, 31.0-31.9, Mina-al-Ahmadi 1.72
- Qatar, 39.0-39.9, Umm Said 2.06

Middle East, Eastern Mediterranean
- Arabian, 36.0-36.9, Sidon 2.46
- Iraq, 36.0-36.9, Tripoli, Banias 2.46

Far East, (Cargoes, FOB Lutong, Sarawak)
- Seria Light, 37-38 2.60

KEY TANKER RATES

(Last paid, per long ton, single voyage)

U.S. Gulf-N. Y., clean (USMC +170%) $7.70†
U.S. Gulf-N. Y., dirty (USMC +172½%) $7.77†
NWI-USNH, dirty (USMC +165%) $7.16†
NWI-UK/Cont., dirty (Scale +285%) 125/1†*
P. Gulf-UK/Cont., dirty (Scale +325%) 209/6†*
Per. Gulf-USNH, dirty (USMC +100%) $25.40

**Sterling. Owners asked: (1) $7.70/7.98 (USMC +170/180%); (2) $7.84/8.12 (USMC +175/185%); (3) $7.43 (USMC +175%).*

The Market Trend

One in the Hand Is Worth Two in the Bush

A new philosophy of doing business has been fostered by the Middle East upset. It's wrapped up in the curious equation that 13 b/d on the pump in Kansas now are worth more than 13,000 b/d flowing in Iraq—if the latter can't reach a market. Or that U. S. refinery sources look safer and safer. Or that an uncommitted tanker suddenly can pay for itself in less time than it takes to build one.

Basically, the Suez-caused change is a shift from a buyers' market to a sellers' market in this hemisphere. It started several months ago, with European hedge buying in the Caribbean, when the Suez blow-up looked imminent. Now the trend is picking up, on both products and crude, in the U. S.

Domestically-produced crude—under the new look—seldom has seemed so valuable. With Middle East supply lines snagged, the way may even be open for general price increases in Texas and Louisiana.

A reorientation of the "coal parity" concept has taken place, too, with the focus moving from this country to Europe. For many years, the coal-vs.-oil battle was fought out at East Coast tidewater—between Gulf Coast bunker fuel and West Virginia soft coal. But now the scene has shifted to London and Rotterdam. For it's over there—especially now that the Middle East supply is vulnerable—that Caribbean fuel oil and Appalachian coal will fight it out for new markets.

A change to the root in shipping philosophy has taken place since Suez. The concrete evidence is that shipyard construction contracts, on vessels nearing completion, suddenly can be sold off for a cool $1-million.

Taut-drawn Middle East supply lines have set off a stampede to control newbuilding tonnage. Time was when 75% coverage on voyage requirements through ownership and long-term-charter tankers was considered adequate for international marketers. This has been stepped up to 85% (because of skyrocketing spot voyage rates) by several U. S. companies. In one extreme case, a British marketer plans to cover himself on transportation 102% (yes, that figure's right) in the future.

And last of all, U. S. buyers—since the Suez crisis—have quit bellyaching. Nobody's hollering that the margins are too small on Caribbean fuel oil contracts. And a supply contract with a U. S. refiner who has a reputation for filling his obligations to the gallon—well, there's nothing quite like it.

Agonizing Reappraisal:

Gulf and East Coast sellers of products are going through a period of assessment as European buy orders flow in.

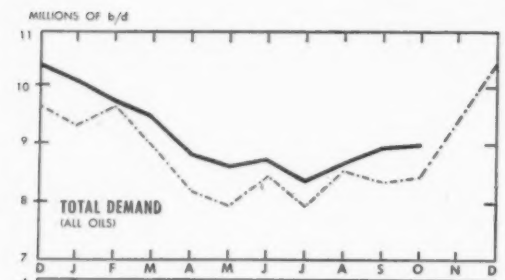
Here's the problem: If the Middle East upset is settled quickly, the refiner who made one- and two-year sales contracts will compliment himself on his foresight. But if the crisis drags on, the seller who offers only in dribs and drabs may realize higher prices in the long run.

Heavy Fuel is Strong:

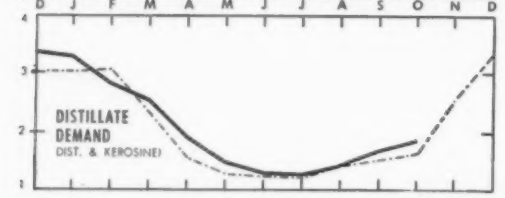
Bunker "C" fuel appears to be the first product to go to a premium as a result of the Middle East crisis. Resale lots of residual, f.o.b. the Caribbean, are being held for as much as 25¢ a bbl. "over posted."

PETROLEUM WEEK'S

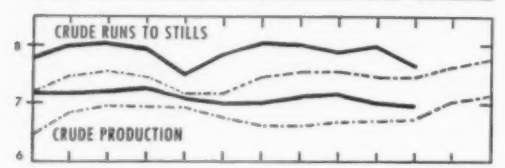
Fingertip Figures



TOTAL DEMAND
Latest 4-week average *
Year ago 8.778

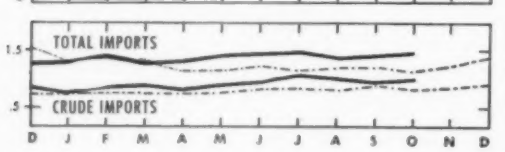


DISTILLATE DEMAND
Latest 4-week average *
Year ago 1.931



RUNS TO STILLS
Latest week *
Previous week 7.853
Year ago 7.563

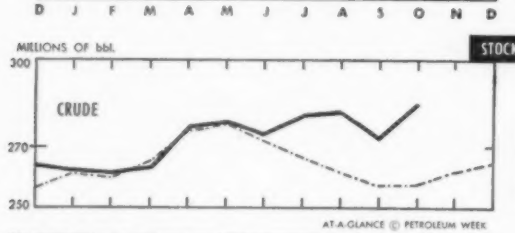
CRUDE PRODUCTION
Latest week *
Previous week 6.981
Year ago 6.808



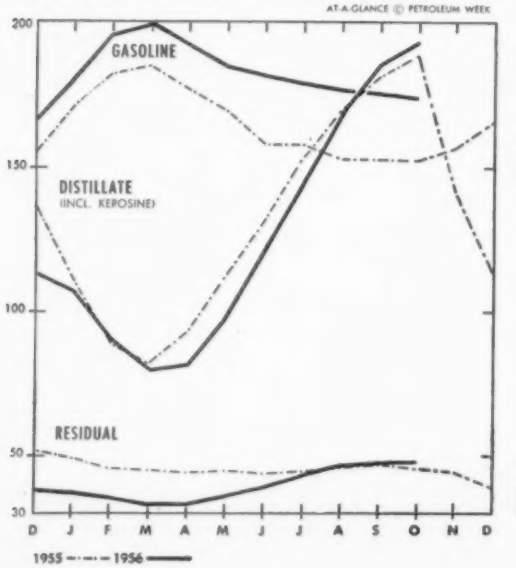
TOTAL IMPORTS
Latest week *
Previous week 1.476
Year ago 1.132

CRUDE IMPORTS
Latest week *
Previous week .922
Year ago .721

STOCKS



CRUDE STOCKS
Week ended 11-3 *
Previous week 283.6
Year ago 256.7



DISTILLATES
Latest week *
Previous week 193.9
Year ago 186.4

GASOLINE
Latest week *
Previous week 172.6
Year ago 152.1

RESIDUAL
Latest week *
Previous week 48.1
Year ago 45.8

Barring a long continuation of the present mild weather over a good part of the nation, a 6% gain in total demand for the year still appears to be a reasonable expectation.

Total demand for the first ten months of the year averaged 9,036,000 b/d, a gain of 6% over last year.

The October movement of 8,985,000 b/d, up 7.7% over last October, provided a big boost to the ten-month total. For the first nine months of the year, demand was 5.7% ahead of 1955.

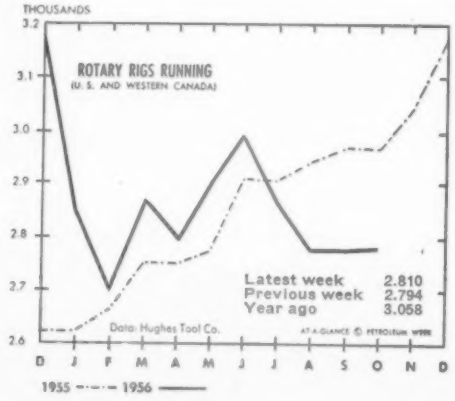
The indicated 6% gain may prove to be a conservative figure if substantial exports of U.S. crude and products to Europe get started before the end of the year.

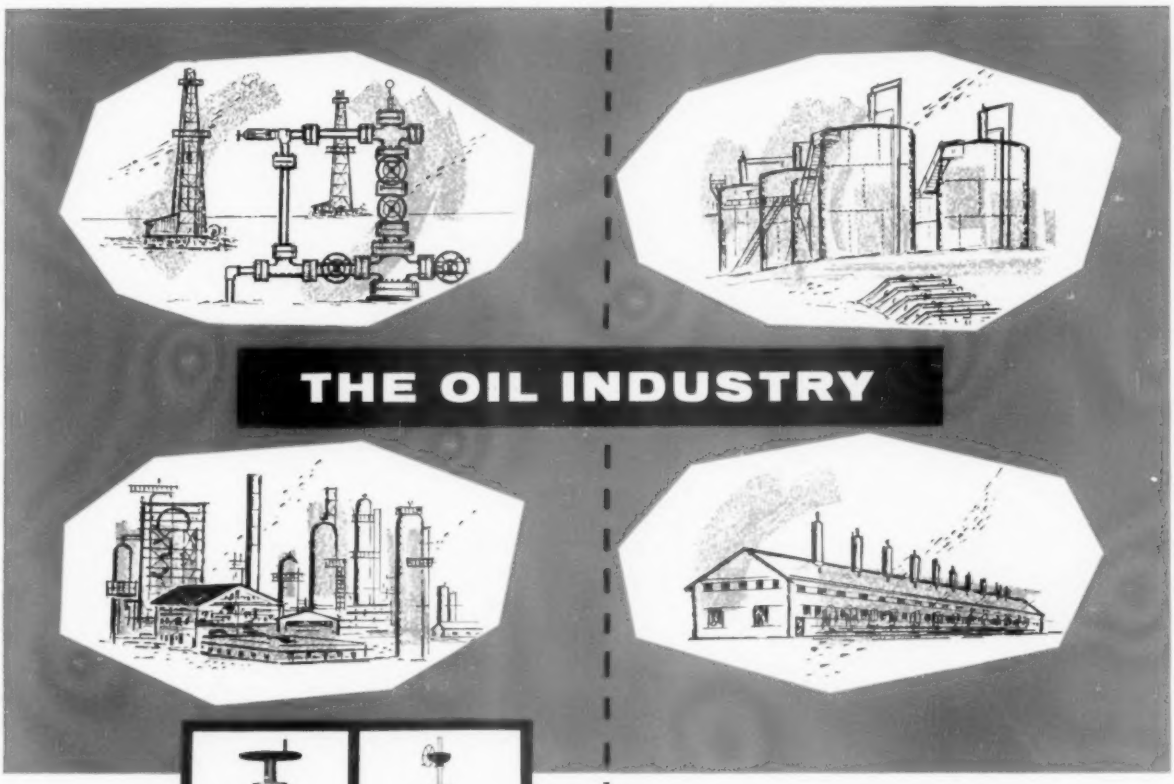
And there is a good chance that export demand—or increased demand for domestic crude to replace lost imports—will be important factors in the total for the year. There are also some indications now that European buyers will take U.S. gasoline on tie-in purchases with U.S. crude and fuel oils (page 23).

Substantial quantities of residual fuel oil already is moving out of the Mid-Continent to the Gulf for export movement and for bunkering the larger number of tankers scheduled into Gulf Coast ports.

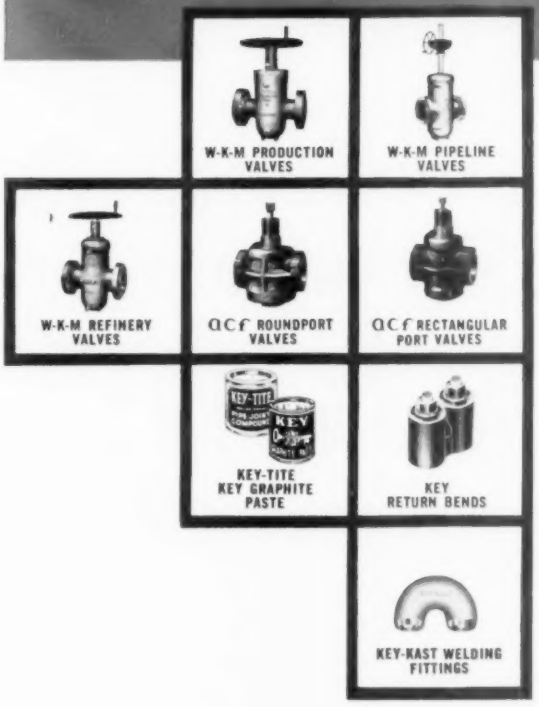
Middle distillates will also figure in European requirements, and export shipments could offset any domestic demand that has been "lost" because of the mild weather.

The demand outlook beyond the end of the year is strong. Recent estimates of a 4% to 6% gain don't take into account a possible boost in export and domestic demand due to the uncertainties in the Middle East.


THOUSANDS
ROTARY RIGS RUNNING
(U. S. AND WESTERN CANADA)
Latest week 2.810
Previous week 2.794
Year ago 3.058
Data: Hughes Tool Co.
AT-A-GLANCE © PETROLEUM WEEK
D J F M A M J J A S O N D
1955 1956



THE OIL INDUSTRY



and W-K-M

These W-K-M products with a world-wide reputation for quality and service are used in all phases of the industry—

At the well— W-K-M through-conduit gate valves are used on christmas trees, flow wings, and high pressure flow lines.

In the field— acf rectangular and round port lubricated plug valves are used on manifolds, headers, and flow lines serving field processing units.

In refineries, gasoline and petro-chemical plants— W-K-M valves are used on high pressure, high temperature product lines; acf valves on service lines handling a wide variety of commodities; KEY return bends are used in furnaces and heaters, and KEY-KAST alloy steel welding fittings are used where tees, wyes, ells, and other shapes are required.

In transit— W-K-M through-conduit pipe line valves are used all along gas, oil, and product pipe lines, in compressor and pumping stations, on loading docks and tank farms.

In distribution— acf valves are used in gas storage and distribution systems serving homes and industry; KEY-TITE and KEY Graphite paste joint compounds are used on lines handling such products as water, steam, natural and artificial gas.

5620

W-K-M

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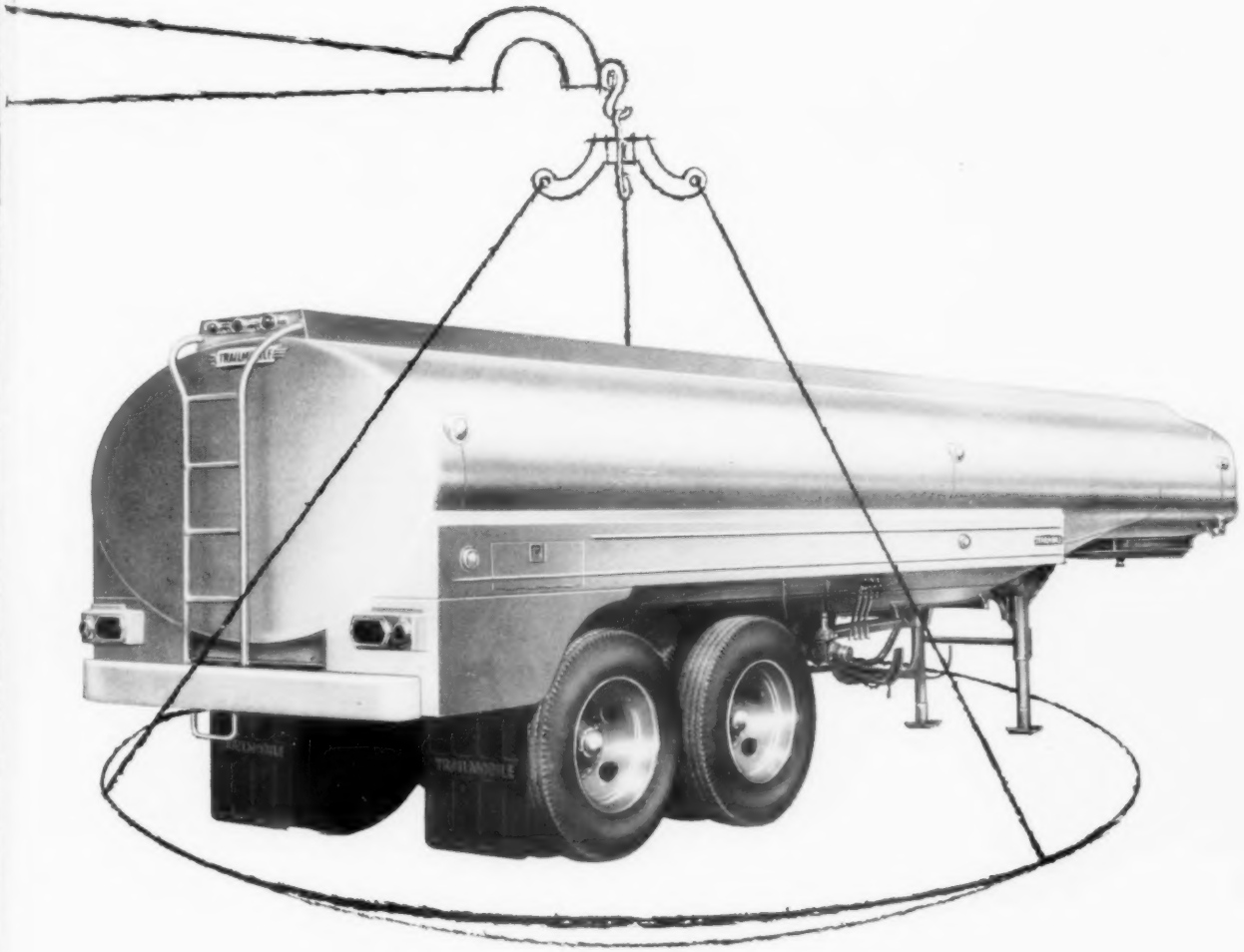


...or STEEL?

The development of new aluminum alloys has provided many opportunities in tank trailer design. With this strong, lightweight material, it is possible to gain as much as 7% more payload than is possible in many similar steel tank designs. On the other hand, for many operations, there are valid reasons for choosing steel over aluminum despite the apparent difference in payload potential.

Trailmobile manufactures both aluminum and steel tanks and maintains factory sales and service outlets in 54 cities. When you are ready to discuss your requirements call your Trailmobile representative first. He is qualified to help you determine which type will fit your operation best. TR-474

TRAILMOBILE INC.

Cincinnati 9, Ohio • Springfield, Missouri • Longview, Texas • Berkeley 10, California

Fair trade is being used by these suppliers . . . . . to set minimum retail prices in these states

	N. J.	Pa.	Mass.	Conn.	R. I.
Amoco	✓		✓	✓	✓
Atlantic	✓	✓	✓	✓	✓
Calso	✓	✓	✓	✓	✓
Cities Service	✓	✓	✓	✓	✓
Esso	✓		✓	✓	✓
Gulf	✓				
Richfield	✓	✓	✓	✓	✓
Shell	✓				
Sinclair	✓	✓			
Socony	✓	✓	✓	✓	✓
Sun	✓				
Texaco	✓		✓	✓	✓
Tidewater	✓	✓	✓	✓	✓

It could be extended into these other states, which have fair trade statutes.

Alabama	Illinois	Maine	Nevada	North Dakota	Tennessee
Arizona	Indiana	Maryland	New Hampshire	Ohio	Washington
California	Iowa	Minnesota	New Mexico	Oklahoma	West Virginia
Delaware	Kansas	Mississippi	New York	South Carolina	Wisconsin
Idaho	Kentucky	Montana	North Carolina	South Dakota	Wyoming

But oil companies call retail price maintenance a last resort. So the industry is asking. . .

Can Fair Trade Harness Prices?

- **For six months, fair trade has kept retail gasoline prices steady in northeastern markets formerly scarred by recurring price wars.**

- **Can it hold the price line? Will it be extended? Is there an alternative? Here are the answers:**

Most marketers, although delighted with the way fair trade has worked out so far, hold out little hope that it will prove to be any panacea for the industry's retail price-war problems.

Back in early spring (PW—May4 '56,p13), Esso Standard Oil Co. got the fair trade movement under way by announcing minimum retail prices on its gasoline in New Jersey. Soon, every major supplier in that state had followed the pricing action of the "market leader," and fair trade was on its way.

Within two months, gasoline retail minimums were established in four other northeastern states (chart).

With few exceptions, gasoline prices in the five fair trade states have risen considerably (in some cases as much as 7¢ a gal.) and remained steady. The "average" rise has been about 3¢ a gal. —despite a recent 2¢-a-gal. reduction in fair trade minimums by majors in Massachusetts.

Then why the reserve in marketers' expectations for fair trade? Here's what a PETROLEUM WEEK survey last week found oil men thinking about the retail price situation:

In principle, suppliers are generally opposed to fair trade. Even those who have adopted retail price maintenance don't give it heartfelt approval. But they say it was a last resort to stop the ruinous northeastern price wars.

In New Jersey, for instance, where fair trade was reborn, gasoline price wars had plagued dealers and suppliers alike for more than five years. Dealers, working on depressed margins due to the price cuts, threatened to close down their stations.

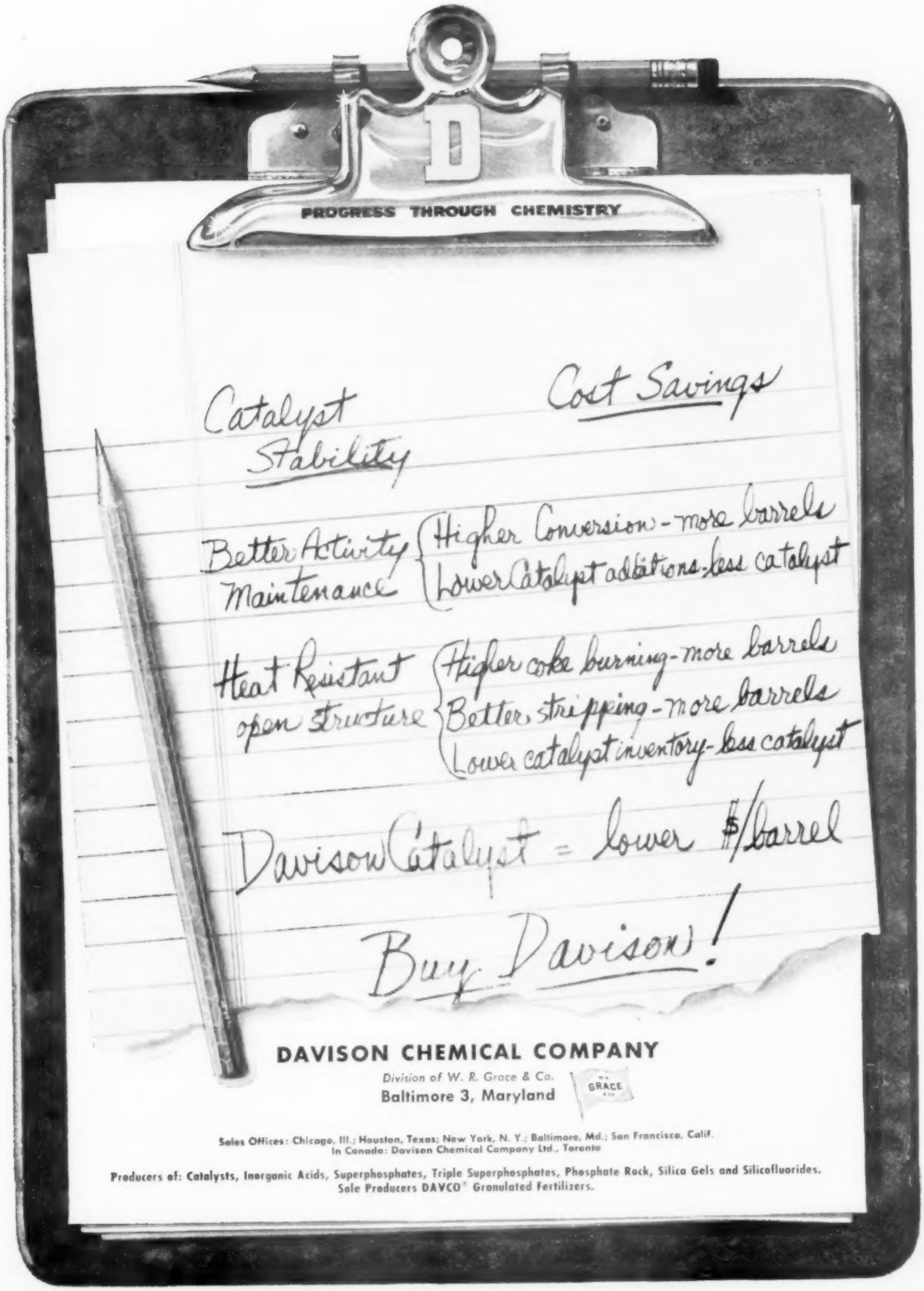
Suppliers were also hurt in the price wars. Besides getting a public relations "black eye," suppliers lost money on gasoline sales in "war" areas.

Finally the situation got so bad that Esso, "to protect its brand name and Esso dealers," made the fair trade move.

Many call fair trade "an artificial means" of setting retail prices.

The marketing vice-president of one fair trading major told PETROLEUM WEEK: "We don't like fair trade primarily because it takes away part of the independent dealer's right to set his gasoline price."

Another executive makes the same point: "When suppliers give inde-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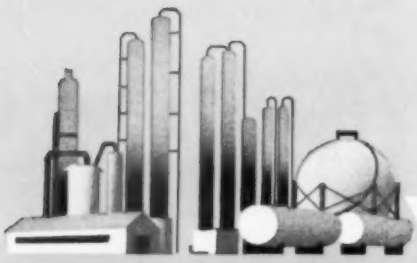

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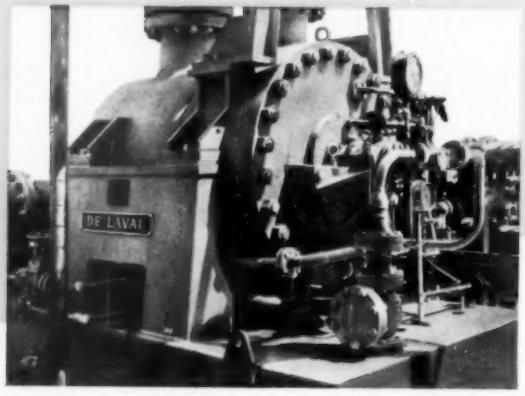

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pendent dealers retail price minimums for gasoline, it borders on regulation."

Some think of it as a muzzle on competition. There's certainly no question that competition is different under fair trade than it is when dealers are free to set their own prices. Service becomes the chief selling point; price is de-emphasized.

Some marketers are aware that "price sameness" in each area can raise the old cry of lack of competition among suppliers.

No government agency has made such charges. In fact, many legislators —including Sen. Hubert Humphrey (D., Minn.), who investigated suppliers' gasoline pricing policies last year—have applauded the fair trade movement.

Fair trading suppliers say that the general swing to fair trade was in no way collusive; that it was caused by the necessity to compete with the suppliers who initiated the action in each case.

However, having adopted fair trade, suppliers have gone to great pains to enforce it. And they say they intend to maintain that enforcement.

So far at least four suppliers—Socony, Esso, Tidewater, and Calso—have taken retailers to court for selling below fair trade minimums. In each case, the court ruled in favor of the supplier.

Just last month (PW—Oct.26'56, p38), a price disturbance in East Boston threatened to break up fair trade throughout Massachusetts. But Socony Mobil Oil Co. lowered its retail minimums throughout the state to make its fair trading stations competitive with price cutters. Other suppliers followed, and the threat now appears to have blown over.

The recent Supreme Court decision in the McKesson & Robbins case is (PW—Jun.15'56,p2), giving fair trading suppliers an additional headache. In that case, the court ruled that a manufacturer who distributes his own product cannot legally fair trade with any of his independent distributors.

Many suppliers interpret this to mean that a supplier cannot operate through company-run stations in an area where it is fair trading with independent dealers. So several suppliers have already converted their company-run stations in fair trade states to independent dealerships. Others are planning to do the same soon.

Despite this, suppliers are determined to keep fair trade working.

Dwight Colley, marketing vice-president of Atlantic Refining Co., recently summed up this point of view: "We are on the right track.

Well-known Newscaster,
WJBK-TV, Detroit

Jac LeGoff asks:

"WOULD YOU WANT YOUR SONS TO ENTER THE SAME BUSINESS YOU'RE IN?"

JACOB A. CITRIN of the Citrin Oil Co., Detroit, Michigan: "In my case—yes, And I'll tell you why. Our company, of which my father and I were the founders, is a wholesale distributor of oil. Our future—and that means the future of my sons—depends largely on two things—the quality of the products we distribute and the policy of our large oil company supplier toward our own smaller oil company. Standard Oil, our major supplier, is noted for fine products. The company's policy toward us in the thirty-five years we have been associated has demonstrated Standard Oil Company's belief in the future of the independent oil jobber. Our relationship is an example of the fine teamwork possible between big and small companies under the American business system. We are now a corporation and one son is already an officer. The interests of the other two sons are being held in trust until they finish their education."

Left to right: Robert M. Citrin, Barney Citrin (co-founder), Jacob A. Citrin (co-founder), Martin E. Citrin, Toby Citrin.

WALLACE A. COWAN, Standard Oil Dealer, Council Bluffs, Iowa: "You bet I do! I have a boy, 16, and he's already helping me after school and on weekends. He wants to start in here full time just as soon as he finishes school, because he likes a service business, a business where he can meet people and be his own boss. There are not many businesses that offer the same opportunity for serving your friends and neighbors."

PAUL PETSCHKE, Standard Oil Agent, Downers Grove, Illinois: "Well, if I had my own life to lead over again, I'd want to do the same thing I'm doing right now. My son is already in my business. He, too, enjoys the friendships that you make in a job like this and also likes having the same opportunities for service. Another thing—people have confidence in my products—and that's pretty hard to beat in business."

JACK CLARK, Standard Oil Dealer, Des Moines, Iowa: "I've been a Standard Oil dealer 22 years. I have been active in church work and civic activities and am a member of the Chamber of Commerce. It is a satisfying life's work to serve people, both in business and out. I would be most happy if my sons, Bill and David, should enter the service station business."

Left to right: Mr. and Mrs. Clark, Bill, David.

What Makes A Business A Good Citizen?

We are proud of our long and successful association with such fine people. In the case of the Citrins, for example, the new officer represents the third generation in the same business. Many Standard dealers, distributors and employees have been with our company for years and many want their sons, too, to continue business relations with us in the oil industry. We regard that as a fine compliment. And we feel that the policies of fair play that helped to create such loyalty contribute to the many benefits received by the public under our free and competitive business system.

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We will not get into trouble helping the little guy . . . I am sure that a minimum take for dealers is just as necessary as a minimum wage if we are to keep this business of ours out of government control, and at the same time provide an opportunity for the small business man to become established and grow."

But a serious and sustained rash of price-cutting could sink the fair trade ship. It would be virtually impossible for suppliers to enforce the price minimums on a large scale.

An assistant sales manager for one of the majors now fair trading puts it this way: "We've already got plenty invested in fair trade. So we're going to protect our investment by strict enforcement.

"But we realize that there's a point of no return in this enforcement. If price-cutting breaks out on a really wide scale among our dealers in a fair trade area, court action would probably prove overly expensive and impractical. Then the whole thing would fall apart."

And the present oversupply of gasoline could easily lead to such price cutting.

The present huge gasoline supply is expected to increase even more during the fall and winter (PW—Nov.2'56, p36). One estimate: Today's 171-million-bbl. supply (20-million bbl. higher than last year's "high" stocks) will be added to a rate of 200,000 b/d in the coming months.

Such a buildup may put new pressure on oil companies' sales organizations. A few salesmen candidly admit that the surplus may cause prices—first wholesale, then retail—to tumble.

But one executive suggests that prices might be lowered within the framework of fair trade. He says that a supplier with a gasoline surplus could lower his fair trade minimum and get rid of at least a great part of it before other suppliers caught up.

However, most marketers question how long this approach would work—without turning into full-scale, uncontrollable price cutting.

Independent private branders are another factor in the market for the most part they've followed along. But what they'll do if the gasoline supply spills over is another question entirely.

So far, most unbranded stations in fair trade areas are selling gasoline at the normal level—2¢ a gal. under the price for branded fuel. But if "overstocks" allow them to buy distress product at low prices, these independents probably wouldn't hold the price line very long. And such unbranded stations do not come under the fair trade agreements; they could cut prices and not even risk being taken to court.

DWIGHT COLLEY, Atlantic's marketing vice-president: "A minimum take for dealers is as necessary as a minimum wage."

Trading stamps could also upset the delicate fair trade balance.

Pennsylvania is a trading-stamp hotbed. Some dealers there—on fair trade, but not stamp-givers—have threatened to meet the stamp competition by cutting retail postings below fair trade levels. So far, the stamp competition hasn't erupted into serious price competition in fair trade areas. But suppliers are apprehensive.

Most dealer groups still back the suppliers' use of fair trade. The dealers are generally happy with their "guaranteed" margins, although a few resent suppliers' "hands in retail prices."

The National Congress of Petroleum Retailers, although it attacks "supplier interference in retail prices," has voiced its approval of the way fair trade has worked in the Northeast. But it withholds official support for the movement.

One dealer representative in New Jersey told PETROLEUM WEEK recently that "the dealers over here are satisfied. Maybe our gallonage is off just a bit, but we've got a higher margin than during those price wars."

What about extension of fair trade into other states? There isn't much chance.

Thirty states (besides the northeastern states now on fair trade) have laws permitting fair trade (chart). So the legal door is open in many states where price wars have plagued the industry.

Ten others—Arkansas, Colorado, Florida, Georgia, Louisiana, Michigan, Nebraska, Oregon, Utah, and Virginia

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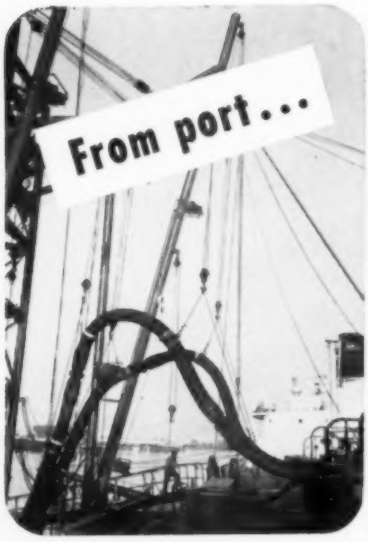

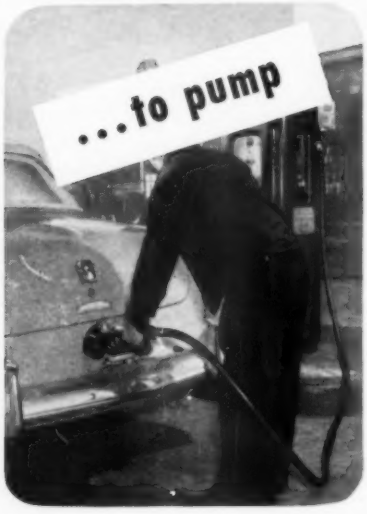

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—have ruled all or part of their fair trade laws unconstitutional. Mississippi, Texas, Vermont, and the District of Columbia have never had such laws.

But suppliers aren't looking for other areas in which to use fair trade. Forced to the wall in the Northeast, the majors say that they won't take the "last resort." But they say that they won't take the step elsewhere unless a parallel situation arises.

On the West Coast, retail gasoline prices have been anything but steady. Still, suppliers there have shied away from fair trade.

Union Oil Co. of California used to fair trade its gasoline, but not any more.

And Richfield Oil Corp., although it has "maintained" fair trade agreements with its dealers in California, pursues a "competitive" pricing policy in "wars." It has never bothered to enforce the agreements through court action.

Another West Coast major calls fair trade "pie in the sky." It says that fair trade couldn't work there "first, because the Far West has an even greater oversupply than the East; and, second, because independents wouldn't go along with it."

But a spokesman for Tidewater Oil Co.'s western division has this to say: "I think fair trade should be tried out here. These price wars cost us a tremendous amount of money. We don't like them or any part of them. We'd rather keep gasoline in our tanks than dump it on the market if we can't make a profit."

The suggested-retail-price plan is an alternative. Atlantic Refining Co. started this plan late last year in Pennsylvania (PW—Dec.16'55,p31), to "coach dealers to get a fair price."

But in June, Atlantic switched from this system to fair trade, because "about 10% of its dealers" disregarded the suggestions and cut prices.

Standard Oil Co. (Ind.) has had better luck with the "suggested price plan." Recently (PW—Oct.5'56,p37), Standard extended the plan to a seventh midwestern marketing area to combat price wars.

Dwight F. Benton, Indiana Standard's marketing vice-president, says, "We of course, can only recommend that our dealers post our suggested retail prices . . . Our prices to our dealers will be computed at a discount from the suggested retail price, regardless of the price actually posted by our dealers."

Recommendation or not, Standard's plan appears to have been successful in stabilizing the troubled markets where it has been introduced.

Another approach to the price war problem: Switch to commission stations, where the supplier has direct control of retail prices.

Union of California went the "C-route" when it went off fair trade.

Other suppliers are also considering increased use of company-run stations (PW—Jul.13'56,p40). One supplier, who is now considering this plan, says: "In the commission station, the dealer is your agent, and you can dictate price. It's still not the answer, but it's probably better than fair trade because the supplier gives greater consideration to the individual's needs. And don't forget, it has pricing flexibility."

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What's New IN MARKETING

Eight major Oregon marketers have pledged their cooperation to the governor in efforts to curb price wars among service stations. The pledges—issued to Gov. Elmo Smith—deny charges of unfair price practices made by the Oregon Gasoline Dealers Assn.

Gov. Smith had written to majors in the state asking assurance of cooperation in ceasing "monopolistic practices" alleged by the dealers (PW—Oct.26'56,p39).

•

A Far West supplier is trying out a new sales gimmick: selling brand-name appliances and housewares at its service stations at discount prices.

Sunset International Petroleum Corp.'s new merchandising policy permits customers to buy these items for cash or by redeeming premium coupons which the company has issued.

Five of Sunset's "Golden Eagle" service stations in Los Angeles were selected to launch the new program. According to Morton A. Sterling, Sunset executive vice-president, this policy "is an extension of our marketing philosophy that a service station is a store."

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J. D. GOODRICH, manager of mechanical engineering for Shell Oil Co., at New York City, has been promoted to production manager of the Tulsa area. He will assume the new position next spring. Until then, **A. G. Copeland,** now chief exploitation engineer of the Tulsa area, will fill the position. Copeland will be succeeded in his present job by **R. E. Clark,** now production manager of the Kansas division.

M. J. (Mel) HILL has been named director of geological research for Gulf Research & Development Co., at Harmarville, Pa. He was formerly division geologist for Western Gulf Oil Co., in Los Angeles. **Bob Johnston,** former district geologist for Western Gulf in Bakersfield, Calif., succeeds Hill. **Iliff Anderson** has replaced Johnston as district geologist in Bakersfield.

R. S. TREMAINE is the new district geologist in Stanolind Oil & Gas Co.'s Casper (Wyo.) exploration office. He replaces **Ian Macartney** who has transferred to the company's foreign exploration department. Tremaine moves to his office from San Antonio, Tex., where he has been district geologist for Stanolind since November, 1955.

JOHN G. RICHARDS has been elected chairman of the Ft. Worth chapter of the American Institute of Mining, Metallurgical & Petroleum Engineers. Other new officers are: **Clarke B. Gillespie,** first vice-chairman; **Jimmie D. Harrington,** second vice-chairman; **Floyd D. Sawyer,** third vice-chairman; **Homer Dailey,** fourth vice-chairman; and **Kenneth L. Dominy,** secretary-treasurer.

RANGER OIL CO., Lusk, Wyo., has elected five new directors: **R. Chamberlain, J. M. Pierce, John W. Agnew, J. D. Mason, and P. C. Badgley.** Former directors **Leon Henderson, John W. Meyer, W. F. Riker,** and **Lowell M. Birrell** have resigned. A Canadian company, West Maygill Oil & Gas, Calgary, has recently acquired controlling stock in Ranger Oil from American Leduc Petroleums, Ltd., New York.

EDD R. TURNER, president of Pan American Production Co., has retired after 21 years with the company. He was Pan American's first employee when the company was formed in 1935. Pan American will be merged, later this year, with Stanolind Oil & Gas Co.

CHARLES H. ZEANAH has been promoted to assistant director of public relations for Ethyl Corp., with headquarters in New York City. **A. C. Hopper** has been named acting superintendent of industrial and community relations at the company's Houston plant, replacing Zeanah.

DR. HAROLD E. ACHILLES has been appointed assistant manufacturing coordinator of Tidewater Oil Co.'s New York divisional office. He has been technical service supervisor of the research department since 1944.

FRANK B. ODASZ has been promoted to manager of the development and control division of Husky Oil Co., Cody, Wyo. He was formerly assistant director of technical service for Husky. Odasz will be in charge of chemical and statistical development and quality control for the company.

BRUCE J. GRINNEL has been appointed district logging engineer for Lane-Wells Co.'s Casper (Wyo.) office. He succeeds **David D. Stedman,** who has transferred to Well Surveys, Inc., in Tulsa.

C. WADE GIBSON, Gibson Bottled Gas, Reedsville, has been elected president of the West Virginia LPG Assn. Other officers are **R. Clifford Lough,** Grafton Road Bottle Gas, Morgantown, vice-president; **R. L. Daugherty,** Daugherty Propane Co., Mineral Wells, treasurer; **Mrs. Paul R. Dixon,** Dix-O-Gas, Inc., Oakland, Md., secretary.

HARRY L. CONNER (left) and **GEORGE D. COMNAS** (right) have been elected vice-presidents of Esso Export Corp., international marketing affiliate of Standard Oil Co. (N. J.). Comnas will head the new crude and product sales department recently established by Esso Export. Prior to his new appointment he was a director of Esso Export, Ltd., with headquarters in London. Conner will continue as comptroller of Esso Export, a post he has held since 1948.

WALTER T. HERGET has been promoted to the newly created post of manager of operations in the manufacturing department of American Oil Co. with headquarters in New York City. He will assure his new duties Jan. 1. He is now general superintendent of the company's new Yorktown (Va.) refinery. **H. A. Parker,** former technical director of the Destrehan (La.) refinery, has been promoted to the new position of assistant manager of operations.

CHARLES J. DEEGAN, Dallas petroleum consultant, will direct public relations for the 26th annual meeting of the Society of Exploration Geophysicists, to be held in November, 1957, in Dallas.

CARL C. RUSSELL will head the electronic computing section of Sinclair Oil & Gas Co.'s accounting department. He has been general accountant for the company.

P. W. JUDAH has been appointed manager of the newly established petroleum chemicals department for Socony Mobil Oil Co. He has been manager of the company's lubricating department since 1952. He will be succeeded by **Paul A. White.**

L. A. BAL has been appointed division landman for Ohio Oil Co., at Casper, Wyo. He succeeds **R. L. Fillner,** who is retiring after 35 years with the company. Bal was formerly assistant division landman in Durango, Colo.

W. E. ARTHUR, vice-president of Bechtel International Corp., has been named Gulf Coast representative at Bechtel Corp.'s new regional headquarters in Houston. He was formerly in business development activities at the firm's main office in San Francisco.

ROBERT E. WILSON, chairman of the board of Standard Oil Co. (Ind.) has been appointed by President Eisenhower to the general advisory committee of the Atomic Energy Commission.

Other Oil Industry Personnel Changes:

Company:	To:	From:
American Potash & Chemical Corp.		
Joseph Adinoff	Sr devel eng, Los Angeles	Chief eng, Los Angeles
Atlantic Refining Co.		
Paul H. Snyder	Mgr, prod supply coordination, domestic mktg dept, Philadelphia	Mgr, automotive section, Philadelphia
William A. Lindsay	Mgr, automotive section, Philadelphia	
Century Geophysical Corp.		
A. J. "Archie" Nicol	Asst mgr, uranium div, Tulsa	Supvr, Grand Junction (Colo.) div office
Delta Tank Mfg. Co.		
John W. Young	Sales eng, Westwego, La.	Mud eng, National Lead Co.'s Baroid div, Bay City, Tex.
D-X Sunray Oil Co.		
H. C. Lechner	Traffic mgr. Tulsa	Asst traffic mgr, Tulsa
L. W. Witte	Retired	Traffic mgr, Tulsa
Hutchinson Oil		
Hank Gumz	Landman, Denver, Colo.	Independent, Denver
E. H. Kellogg & Co., Inc.		
Joseph T. Cummings	Gen mgr, operations and sales, Mt. Vernon, N. Y.	Mgr, wholesale and export sales, Paragon Oil Co., Brooklyn, N. Y.
Kobe, Inc.		
W. F. Slater	Vice-pres, sales, Huntington Park, Calif.	Gen sales mgr, Huntington Park
Lane-Wells Co.		
Edward C. Butt, Jr.	Dist sales eng, Houston	Jr field serv eng, Houma, La.
National Lead Co., Baroid Div.		
Dr. J. W. Jordan	Tech dir, lab activities, Houston	
R. E. Offeman	Assoc tech dir, Houston	
Jay P. Simpson	Supvr, drilling muds lab, Houston	
Dr. R. E. Fariss	Supvr, bentone lab, Houston	
Dr. J. L. McAtee	Supvr, tech service lab, Houston	
Phillips Petroleum Co.		
M. L. Atkinson	Supt, central div, Oklahoma City	Supt, Philtex div, Ponca City, Okla.
George J. Turner	Retired	Supt, central div, Oklahoma City
Sinclair Oil & Gas Co.		
M. L. Moore, Jr.	Asst dist prod foreman, Lovington, N. M.	Roustabout, Gainesville, Tex.
Charles C. Conrad	Asst dist prod foreman, Odessa, Tex.	Pumper, Longview, Tex.
Charles A. Shaid	Dist prod foreman, Odessa	Dist prod foreman, Hobbs, N. M.
Carl C. Russell	Head, electronics computing section, acctg dept, Tulsa	Gen accountant, Tulsa
Harold Moore	Div scout, Denver	Gulf Oil Corp, Casper, Wyo.
John R. Cox	Asst dist landman, Casper	Scout, Casper
Shelly Oil Co.		
Leon Griffith	Landman, Bismarck, N. D.	
St. Helens Petroleum		
M. A. Jenkins, Jr.	Geological staff, Los Angeles	Pubco Development Corp.
M. D. Picard	Geological staff, Los Angeles	Shell Oil Corp.
Sunray Mid-Continent Oil Co.		
Carl E. Davis	Coordinator, federal and Indian lands, Tulsa	Landman, Casper, Wyo.
Frank Devlin	Dist geologist, Albuquerque	
Paul Hoovler	Dist geologist, Casper	
Tidewater Oil Co.		
C. A. Phillips	Supvr, desulfurizing and hydrogen area, Delaware City	Chief refinery eng, Drumright, Okla.
Robert C. Harms	Gen coordinator, Delaware City	
George E. Rohrmann	Gen coordinator, Delaware City	
John J. Dudowicz	Electrical coordinator, Delaware City	Refinery advisory group, Alhambra, Calif.
Samuel E. Roth	Instrumentation coordinator, Delaware City	Refinery advisory group, Alhambra
The Texas Co.		
Max Park	Asst mgr, Houston sales div.	Asst div mgr, sales promotion, Houston
Trunkline Gas Co.		
E. Rue Thomas	Supt, gas supply, Houston	Eng, gas dept, Humble Oil & Refining Co., Houston
Tuloma Gas Products Co.		
Andrew N. Fusie	Sales dept, Tulsa	LPG sales, Rapid City, S. D.
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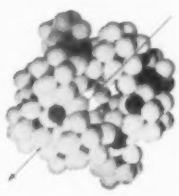

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Let's Speak With One Voice

NEITHER the current crisis in the Middle East nor the election outcome has changed one major task facing the petroleum industry in the months ahead.

That task is to achieve sufficient unity to counter effectively some of the "slings and arrows" of outrageous bias being hurled at it.

The American Petroleum Institute is taking one long step in this direction through the proposed establishment of a greatly-expanded Washington office (PW—Nov.9'56, p10).

As PETROLEUM WEEK pointed out nearly a year ago (PW—Dec.16'55,p36), such an office, headed by a man of outstanding prestige in the industry, could do much to insure that oil's position on important national issues is effectively and forcefully put before Congress—and thus before the nation as a whole. The office could carry forward on a broader scale the work of such existing organizations as the Independent Petroleum Assn. of America, whose Washington officials have long played an important role in capital affairs.

JUST WHAT are the principal objectives which the industry must meet? Jake L. Hamon, API board chairman, detailed them clearly in his recent speech before IPAA. No. 1, of course, is that "We must, as an industry, think together and act together against common dangers and enemies." Following that come these "major jobs":

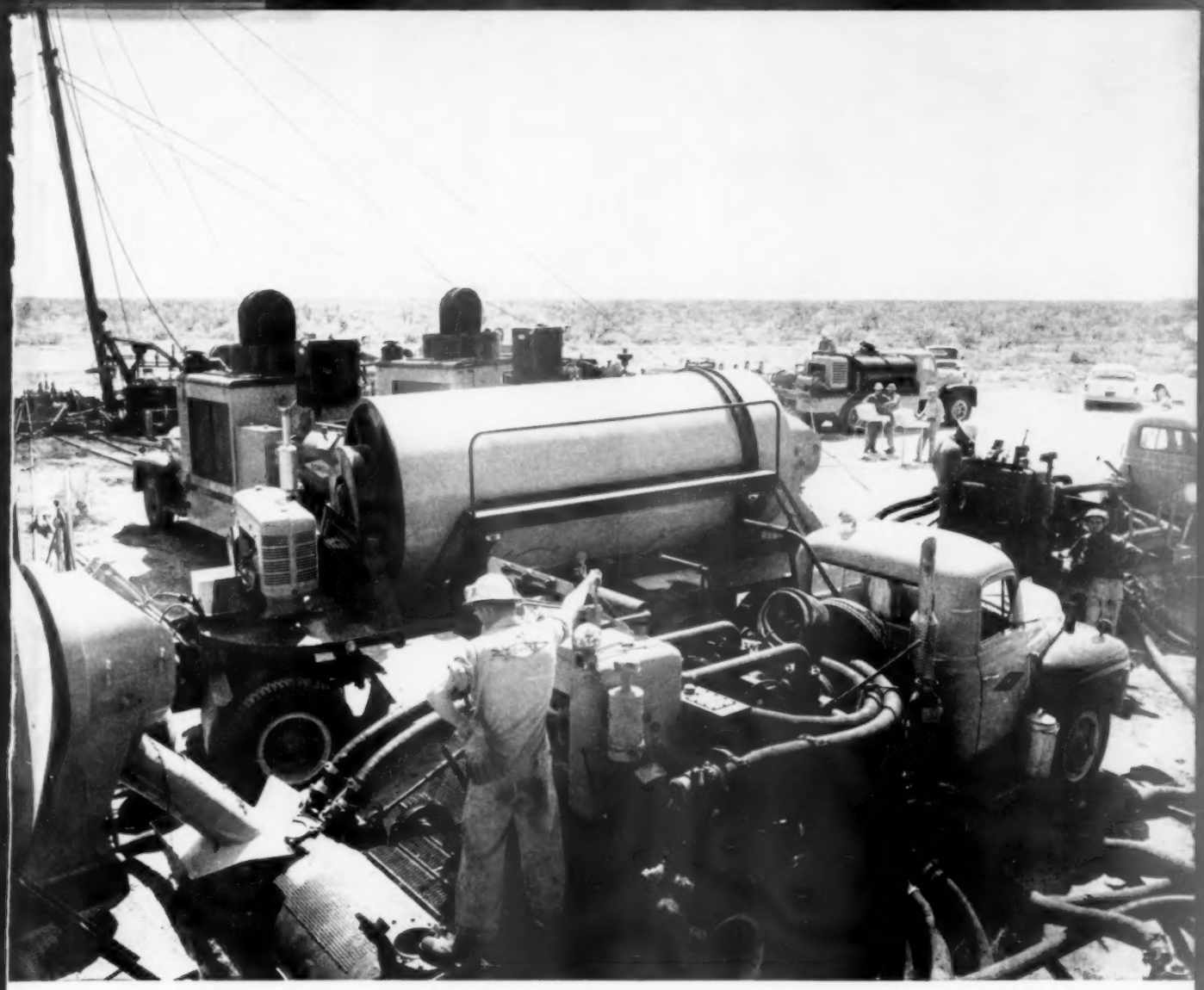
- "Guard against continuing threats to incentive, particularly against the continued agitation over the percentage depletion provision."
- "Be alert to the ever-widening peril of government domination, whether it be federal, state, or local government."
- "Encourage the healthy development of the independent producers."
- "Generate an atmosphere favorable to the enactment of a natural gas bill acceptable to our industry and to the general public."
- "Create, and perpetuate, a dynamic, nation-wide, industrywide program, reaching all members of the public, in order to raise our industry to the high place it should occupy in public esteem."

Boiled down, says Hamon, it simply amounts to this: "No one of us can afford to operate strictly within the narrow limits of his own particular end of the industry."

LITTLE CAN BE accomplished, however, until and unless some of the public's good opinion of the industry is restored. Again quoting Hamon: "The furore over the gas bill, the conservation battle in California, the attacks by jobbers and dealers, the battles between the independents and the marketers over imports, are all contributing factors" to this lowering of public esteem.

"The public," he adds, "looks at us as one industry—and properly so,—and we can't tear down one segment without hurting the whole of us."

THERE'S NOTHING in last week's election outcome that alters any of Hamon's statements. Again we will have a Republican Administration and a Democratic Congress. Legislation-wise, the same issues will be supported or opposed by the same people. As PETROLEUM WEEK pointed out last week (PW—Nov.9'56,p6), all this spells more uncertainty for oil in Washington. So the industry has its work cut out for it.



Dowell engineers control Allison-Powered Pumpers, upper left, from remote panels at upper right. Men in foreground operate blenders.

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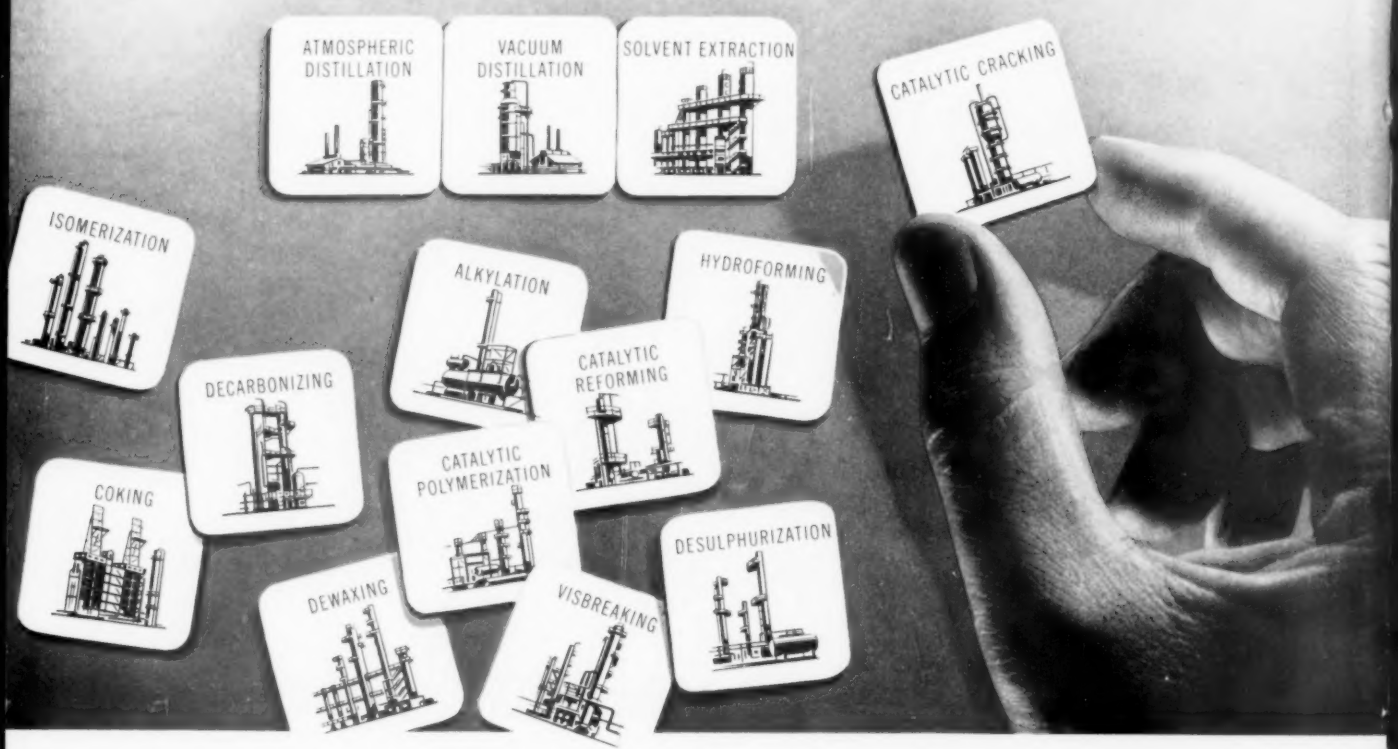

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